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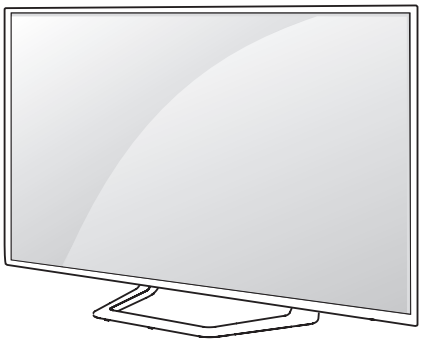
LED LCD TV
SERVICE MANUAL

CHASSIS : LC21C

MODEL : 32LS3500

32LS3500-CA

CAUTION
BEFORE SERVICING THE CHASSIS,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.



P/NO : MFL67360705(1204-REV00)

Printed in China

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SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and Exploded View.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.

General Guidance

An **isolation Transformer should always be used** during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and it's components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1 W), keep the resistor 10 mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

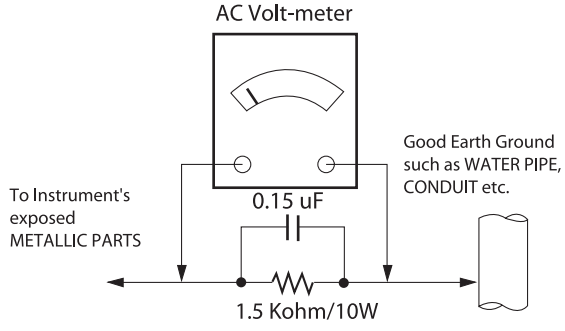
always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

Leakage Current Cold Check(Antenna Cold Check)
With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.
If the exposed metallic part has a return path to the chassis, the measured resistance should be between 1 MΩ and 5.2 MΩ.
When the exposed metal has no return path to the chassis the reading must be infinite.
An other abnormality exists that must be corrected before the receiver is returned to the customer.

Leakage Current Hot Check (See below Figure)
Plug the AC cord directly into the AC outlet.

Do not use a line Isolation Transformer during this check.
Connect 1.5 K / 10 watt resistor in parallel with a 0.15 uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.
Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.
Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which is corresponds to 0.5 mA.
In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit



When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than 0.1 Ω
*Base on Adjustment standard

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SERVICING PRECAUTIONS

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the *SAFETY PRECAUTIONS* on page 3 of this publication.
NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
   a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
   b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
   CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe. Do not test high voltage by "drawing an arc".
3. Do not spray chemicals on or near this receiver or any of its assemblies.
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10 % (by volume) Acetone and 90 % (by volume) isopropyl alcohol (90 % - 99 % strength)
   CAUTION: This is a flammable mixture.
   Unless specified otherwise in this service manual, lubrication of contacts in not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
   Always remove the test receiver ground lead last.
8. Use with this receiver only the test fixtures specified in this service manual.
   CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid-state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor “chip” components. The following techniques should be used to help reduce the incidence of component damage caused by static by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type solder removal device. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range or 500 °F to 600 °F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25 cm) brush with a metal handle. Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
   a. Allow the soldering iron tip to reach normal temperature. (500 °F to 600 °F)
   b. Heat the component lead until the solder melts.
   c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
   a. Allow the soldering iron tip to reach a normal temperature (500 °F to 600 °F)
   b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
   c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil.
   d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

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IC Remove/Replacement
Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal
1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement
1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

"Small-Signal" Discrete Transistor Removal/Replacement
1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

Power Output, Transistor Device
Removal/Replacement
1. Heat and remove all solder from around the transistor leads.
2. Remove the heat sink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heat sink.

Diode Removal/Replacement
1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicular y to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor
Removal/Replacement
1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.
   CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair
Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections
To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

At Other Connections
Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side.
   Carefully crimp and solder the connections.
   CAUTION: Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.

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SPECIFICATION

NOTE : Specifications and others are subject to change without notice for improvement.

1. Application range

This specification is applied to the LCD TV used LC21C chassis.

2. Requirement for Test

Each part is tested as below without special appointment.

1) Temperature: 25 °C ± 5 °C(77 °F ± 9 °F), CST: 40 °C ± 5 °C
2) Relative Humidity: 65 % ± 10 %
3) Power Voltage
   : Standard input voltage (AC 100-240 V~, 50/60 Hz)
   * Standard Voltage of each products is marked by models.
4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.
5) The receiver must be operated for about 20 minutes prior to the adjustment.

3. Test method

1) Performance: LGE TV test method followed
2) Demanded other specification
   - Safety : CE, IEC specification
   - EMC : CE, IEC
   - Wireless : Wireless HD Specification (Option)

4. Model General Specification

No.	Item	Specification	Remarks
1.	Market	HONG KONG (PAL/DTMB Market)	
2.	Broadcasting system	1) PAL-DK 2) PAL-I 3) NTSC-M 4) DVB-C 5)DTMB	
3.	Receiving system	Analog : Upper Heterodyne Digital : COFDM,QAM	► DTMB (Carrier , Code Rate , Constellation , Frame Header , Interleaving)*. China - MODE1 : 3780 , 0.4 , 16QAM , PN945 , 720 , 9.626Mbps - MODE2 : 1 , 0.8 , 4QAM , PN595 , 720 , 10.396Mbps - MODE3 : 3780 , 0.6 , 16QAM , PN945 , 720 , 14.438Mbps - MODE4 : 1 , 0.8 , 16QAM , PN595 , 720 , 20.791Mbps - MODE5 : 3780 , 0.8 , 16QAM , PN420 , 720 , 21.658Mbps - MODE6 : 3780 , 0.6 , 64QAM , PN420 , 720 , 24.365Mbps - MODE7 : 1 , 0.8 , 32QAM , PN595 , 720 , 25.989Mbps *. HONG KONG - MODE : 3780 , 0.4/0.6 , 4/16/64QAM , PN945 , 720 QPSK : 1/2, 2/3, 3/4, 5/6, 7/8 16-QAM : 1/2, 2/3, 3/4, 5/6, 7/8 64-QAM : 1/2, 2/3, 3/4, 5/6, 7/8 ► DVB-C - Symbolrate : 4.0Msymbols/s to 7.2Msymbols/s - Modulation : 16QAM, 64-QAM, 128-QAM and 256-QAM
4.	Video Input RCA(1EA)	PAL,NTSC	REAR 1EA
5.	Component Input	Y/Cb/Cr, Y/Pb/Pr	
6.	RGB Input	RGB-PC	Analog(D-SUB 15PIN)
7.	HDMI Input	HDMI1-DTV/DVI, HDMI3-DTV/DVI,	PC(HDMI version 1.3) Support HDCP
8.	Audio Input	RGB/DVI Audio, AV, Component	L/R Input
9.	SPDIF out	SPDIF out	
10	USB Input	FEMF, DivX HD, For SVC (download)	JPEG, MP3, DivX HD
11	Lan Jack		

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5. Component Video Input (Y, CB/PB, CR/PR)

No.	Resolution	H-freq(kHz)	V-freq(Hz)	Porposed
1	720×480	15.73	60.00	SDTV, DVD 480i
2	720×480	15.63	59.94	SDTV, DVD 480i
3	720×480	31.47	59.94	480p
4	720×480	31.50	60.00	480p
5	720×576	15.625	50.00	SDTV, DVD 625 Line
6	720×576	31.25	50.00	HDTV 576p
7	1280×720	45.00	50.00	HDTV 720p
8	1280×720	44.96	59.94	HDTV 720p
9	1280×720	45.00	60.00	HDTV 720p
10	1920×1080	31.25	50.00	HDTV 1080i
11	1920×1080	33.75	60.00	HDTV 1080i
12	1920×1080	33.72	59.94	HDTV 1080i
13	1920×1080	56.250	50	HDTV 1080p
14	1920×1080	67.5	60	HDTV 1080p

6. RGB input (PC)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Proposed	Remark
1	640*350	31.47	70.09	EGA	
2	720*400	31.468	70.08	VESA(VGA)	
3	640*480	31.469	59.94	VESA(SVGA)	
4	800*600	37.879	60.31	VESA(XGA)	
5	1024*768	48.363	60.00	VESA	
	1152*864	54.348	60.053	VESA	
7	1360*768	47.72	59.8	VESA(WXGA)	
8	1920*1080	66.587	59.93	WUXGA(CEA 861D)	FHD only

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7. HDMI Input

7.1. DTV mode

No.	Resolution	H-freq(kHz)	V-freq.(kHz)	Proposed	Proposed
1.	720*480	31.469 / 31.5	59.94 / 60	27.00/27.03	SDTV 480P
2.	720*576	31.25	50	54	SDTV 576P
3.	1280*720	37.500	50	74.25	HDTV 720P
4.	1280*720	44.96 / 45	59.94 / 60	74.17/74.25	HDTV 720P
5.	1920*1080	33.72 / 33.75	59.94 / 60	74.17/74.25	HDTV 1080I
6.	1920*1080	28.125	50.00	74.25	HDTV 1080I
7.	1920*1080	26.97 / 27	23.97 / 24	74.17/74.25	HDTV 1080P
8.	1920*1080	33.716/ 33.75	29.976/30.00	74.25	HDTV 1080P
9.	1920*1080	56.250	50	148.5	HDTV 1080P
10.	1920*1080	67.43 / 67.5	59.94 / 60	148.35/148.50	HDTV 1080P

7.2. PC mode

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Proposed	Remark
1	640*350	31.47	70.09	EGA	
2	720 x 400	31.468	70.08	DOS	
3	640 x 480	31.469	59.94	VESA	
4	800 x 600	37.879	60.31	VESA	
5	1024 x 768	48.363	60.00	VESA(XGA)	
6	1360 x 768	47.712	59.8	WXGA	
7	1280 x 1024	63.595	60.0	SXGA	
8	1920 x 1080	67.5	60.0	WUXGA	FHD only(support to RGB-PC)

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ADJUSTMENT INSTRUCTION

1. Application *

1.1 This spec sheet is applied all of the LCD TV with LB21A/B/C chassis.

1.2 Main manufacturing type

- SET (O)
- SKD (O)
- CKD (O)

2. Designation

2.1 The adjustment is according to the order which is designated and which must be followed, according to the plan which can be changed only on agreeing.

2.2. Power adjustment : Free Voltage.

2.3. Magnetic Field Condition: Nil.

2.4. Input signal Unit: Product Specification Standard.

2.5. Reserve after operation : Above 5 Minutes (Heat Run)

Temperature : at 25℃±5°C

Relative humidity : 65 ±10%

Input voltage : 220V, 60Hz

2.6. Adjustment equipments : Color Analyzer(CA-210 or CA-110), DDC Adjustment Jig, SVC remote controller.

2.7 **Push The "IN STOP KEY" – For memory initialization.**

Case1 : Software version up

1. After downloading S/W by USB , TV set will reboot automatically
2. Push ñIn-stopòkey
3. Push ñPower onòkey
4. Function inspection
5. After function inspection, Push ñIn-stopòkey.

Case2 : Function check at the assembly line

1. When TV set is entering on the assembly line, Push ñIn-stopòkey at first.
2. Push ñPower onòkey for turning it on.
   ➔ If you push ñPower onòkey, TV set will recover channel information by itself.
3. After function inspection, Push ñIn-stopòkey.

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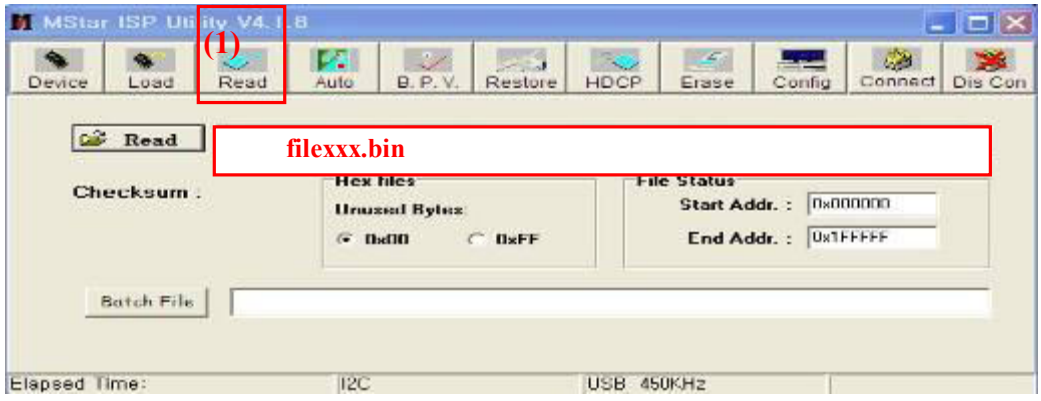
3. Main PCB check process

*** APC - After Manual-Insert, executing APC**

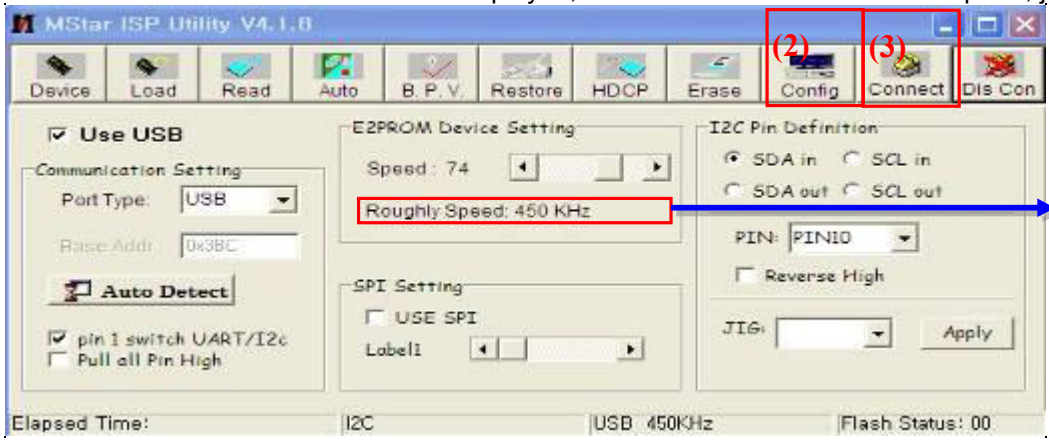
* Boot file Download

1. Execute ISP program “Mstar ISP Utility” and then click “Config” tab.
2. Set as below, and then click “Auto Detect” and check “OK” message

   If “Error” is displayed, Check connection between computer, jig, and set.
3. Click “Read” tab, and then load download file (XXXX.bin) by clicking “Read”

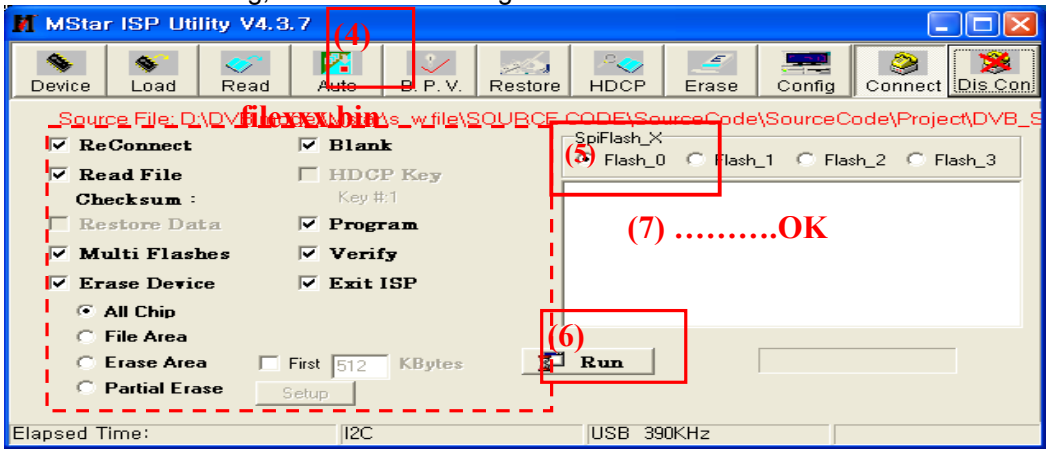


4. Click “Connect” tab. If “Can’t ” is displayed, Check connection between computer, jig, and set.



Please Check the Speed :
To use speed between from 200KHz to 400KHz

5. Click “Auto” tab and set as below.
6. Click “Run”.
7. After downloading, check “OK” message.



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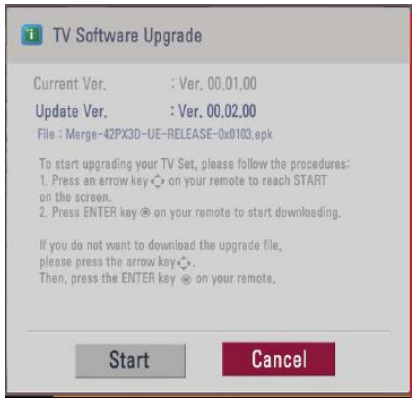
* USB download (*.epk file download)

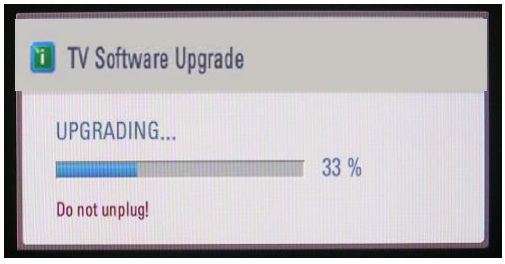
1. Put the USB Stick to the USB socket
2. Automatically detecting update file in USB Stick.

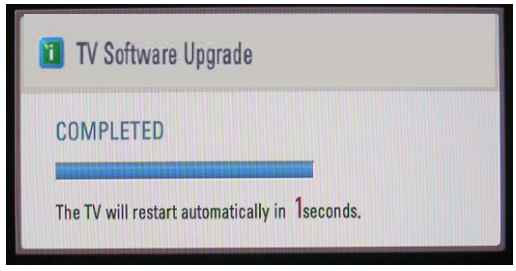


- If version of update file in USB Stick is lower, it will not work.
  But version of update file is higher, USB data will be detected automatically.

3. Show the message ñCopying files from memoryò

4. Updating is staring.





5. Updating Completed, The TV will restart automatically.
6. If your TV is turned on, check your **updated version** and **Tool option**. (explain the Tool option, next stage)

* If downloading version is more high than your TV have, TV can lost all channel data. In this case, **you have to channel recover.** if all channel data is cleared, you didnôt have a DTV/ATV test on production line.

* After downloading, have to check and adjust TOOL OPTION again.

1. Push "IN-START" key in service remote controller.
2. Select "Tool Option 1" and Push ñOKò button.
3. Punch in the number. (Each of models has their number)

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Model	Module	Tool opt 1	Tool opt 2	Tool opt 3	Tool opt 4	Tool opt 5
47LS4100-CA	LGD	33079	2498	9539	13240	2048
42LS4100-CA	LGD	33078	2498	9539	13240	2048
42CS460-CB	LGD	32790	450	9291	13232	2561
32CS460-CB	LGD	32788	450	9291	13232	2592
32LS3500-CA	LGD	33060	33218	9547	13232	2080
42LM3400-CC	LGD	33206	450	25803	46000	2080
42LM3100-CC	LGD	33286	450	25795	46008	2080
32LM3100-CC	LGD	33284	450	25795	46008	2080
55LM4600-CC	LGD					
47LM4600-CC	LGD					

4. Completed selecting Tool option.

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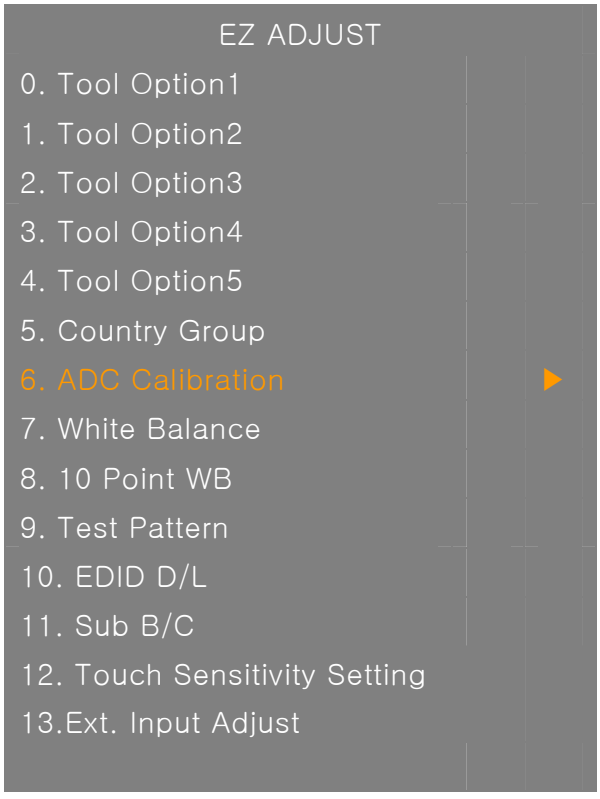
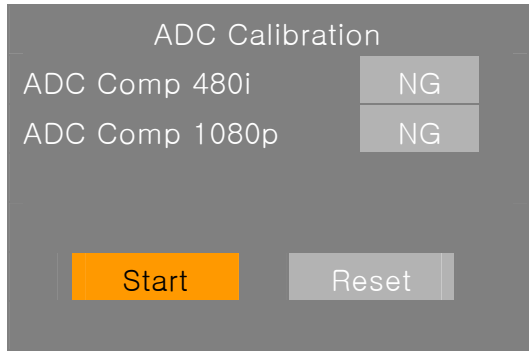
3.1 ADC Process

3.1.1. ADC

y' Enter Service Mode by pushing ñADJò key,

y' Enter **Internal ADC** mode by pushing ñ ò key at ñ6. ADC Calibrationò





□ **Caution: Using 'P-ONLY' button** of the Adjustment R/C , power on TV.

※ ADC Calibration Protocol (RS-232)

NO	Item	CMD 1	CMD 2	Data 0		
Enter Adjust MODE	Adjust ðMode Inô	A	A	0	0	When transfer the ðMode Inô, Carry the command.
ADC adjust	ADC Adjust	A	D	1	0	Automatically adjustment (The use of a internal pattern)

Adjust Sequence

ïaa 00 00 [Enter Adjust Mode]

ïxb 00 40 [Component1 Input (480i)]

ïad 00 10 [Adjust 480i Comp1]

ïxb 00 60 [RGB Input (1024*768)]

ïad 00 10 [Adjust 1024*768 RGB]

ïaa 00 90 End Adjust mode

※ Required equipment : Adjustment R/C.

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3.2 Function Check

3.5.1 Check display and sound

y Check Input and Signal items. (cf. work instructions)

1. TV
2. AV
3. COMPONENT (480i)
4. HDMI

* Display and Sound check is executed by Remote controller.

☞ **Caution : Not to push the INSTOP KEY after completion if the function inspection.**

4. Total Assembly line process

4.1 Adjustment Preparation

y W/B Equipment condition

CA210 : CCFL/EEFL ➔ CH 9, Test signal : Inner pattern (**80IRE**)

LED ➔ CH 14, Test signal : Inner pattern (**80IRE**)

y Above 5 minutes H/run in the inner pattern. (ñpower onòkey of adjust remote control)

Color Temperature	Cool	**11,000k**	K	**X=0.276 (±0.002) Y=0.283 (±0.002)**	**O/S TN Edge LED/ Lamp under 26”**	<Test Signal> Inner pattern **(204gray, 80IRE)**
	Medium	**9,300k**	K	**X=0.285 (±0.002) Y=0.293 (±0.002)**		
	Warm	**6,500k**	K	**X=0.313 (±0.002) Y=0.329 (±0.002)**		
	Cool	**11,000k**	K	**X=0.276 (±0.002) Y=0.283 (±0.002)**	**All LCD and O/S LED(except LGD),lamp over 26”**	
	Medium	**9,300k**	K	**X=0.285 (±0.002) Y=0.293 (±0.002)**		
	Warm	**6,500k**	K	**X=0.313 (±0.002) Y=0.329 (±0.002)**		

◈ **Edge LED W/B Table in process of aging time (Only LGD Edge LED Module)**

CA210 : CH 14, Test signal : Inner pattern (**80IRE**)

S7LR2	Aging time (Min)	Cool(13000K)		Medium(9300K)		Warm(6500K)	
		x	y	x	y	x	y
		269	273	285	293	313	329
1	0-2	280	287	296	307	320	337
2	3-5	279	285	295	305	319	335
3	6-9	277	284	293	304	317	334
4	10-19	276	283	292	303	316	333
5	20-35	274	280	290	300	314	330
6	36-49	272	277	288	297	312	327
7	50-79	271	275	287	295	311	325
8	80-149	270	274	286	294	310	324
9	Over 150	269	273	285	293	309	323

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◈Direct LED W/B adjust target value (Only LGD direct LED, LM3100/LM3400 series)

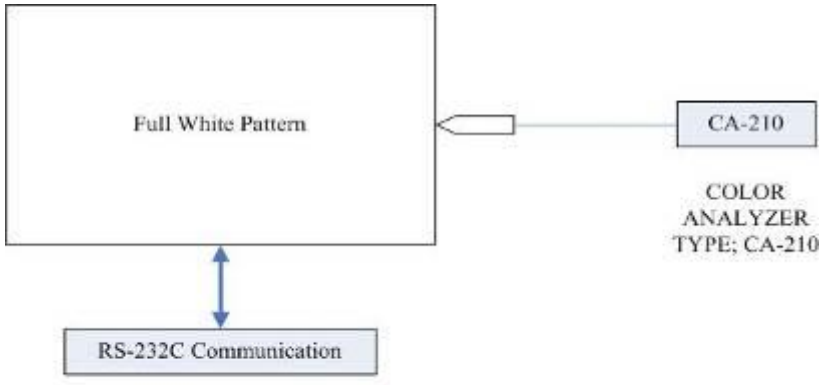
Target (Direct LED)	Cool		Medium		Warm	
	x	y	x	y	x	y
	271	276	287	296	315	332

◈ Summary about W/B information

Model Information			W/B Information			
Model	Maker	Type	Cool (C50)	Medium (0)	Warm (W50)	W/B table for LGD edge LED
47LS4100-CA	LGD	Edge LED	13000K	9300K	6500K	O
42LS4100-CA	LGD	Edge LED	13000K	9300K	6500K	O
32LS3500-CA	LGD	Edge LED	13000K	9300K	6500K	O
42CS460-CB	LGD	EEFL	11000K	9300K	6500K	X
32CS460-CB	LGD	EEFL	11000K	9300K	6500K	X
42LM3400-CC	LGD	Direct LED	13000K	9300K	6500K	X
42LM3100-CC	LGD	Direct LED	13000K	9300K	6500K	X
32LM3100-CC	LGD	Direct LED	13000K	9300K	6500K	X
55LM4600-CC	LGD	Edge LED	13000K	9300K	6500K	O
47LM4600-CC	LGD	Edge LED	13000K	9300K	6500K	O

※ Connecting picture of the measuring instrument (On Automatic control)

Inside PATTERN is used when W/B is controlled. Connect to auto controller or push Adjustment R/C P-ONLY → Enter the mode of White-Balance, the pattern will come out.



[Fig.5] connecting picture (On Automatic Control)

Auto-control interface and directions

1. Adjust in the place where the influx of light like floodlight around is blocked. (Illumination is less than 10ux).
2. Adhere closely the Color Analyzer (CA210) to the module less than 10cm distance, keep it with the surface of the Module and Color Analyzerôs Prove vertically.(80~100°).
3. Aging time

-. After aging start, keep the power on (no suspension of power supply) and heat-run over 5 minutes.

-. Using ôno signalôor ôPOWER ONLYôor the others, check the back light on.

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Auto adjustment Map(RS-232C)

RS-232C COMMAND

[CMD ID DATA]

Wb 00 00 White Balance Start

Wb 00 ff White Balance End

	RS-232C COMMAND [CMD ID DATA]			MIN	CENTER (DEFAULT)			MAX
	Cool	Mid	Warm		Cool	Mid	Warm	
R Gain	jg	Ja	jd	00	172	192	192	192
G Gain	jh	Jb	je	00	172	192	192	192
B Gain	ji	Jc	jf	00	192	192	172	192
R Cut					64	64	64	128
G Cut					64	64	64	128
B Cut					64	64	64	128

** Caution **

Color Temperature : COOL, Medium, Warm.

One of R Gain/G Gain/ B Gain should be kept on 0xC0, and adjust other two lower than C0.

(when R/G/B Gain are all C0, it is the FULL Dynamic Range of Module)

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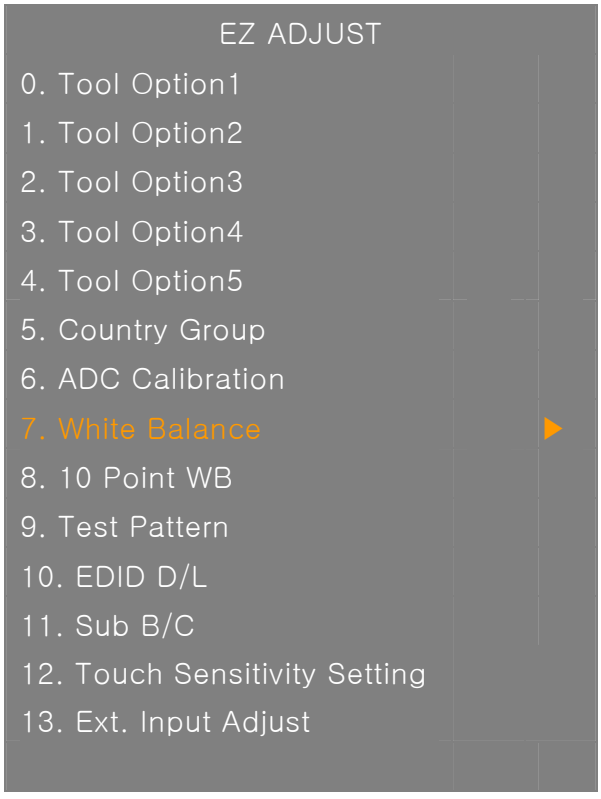
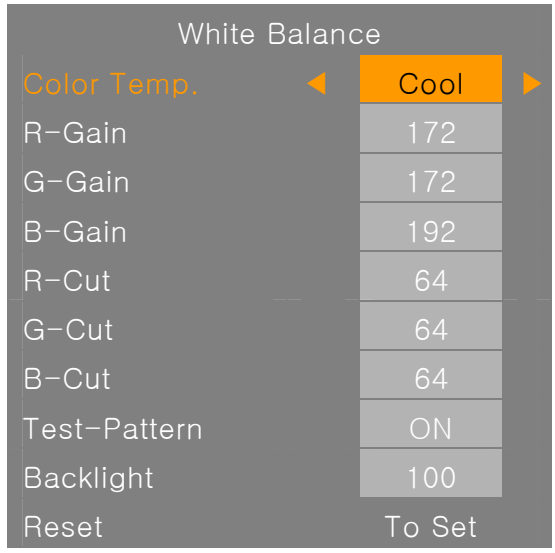
* **Manual W/B process** using adjusts Remote control.

y After enter Service Mode by pushing ñ**ADJ**òkey,

y Enter **White Balance** by pushing ñ↓òkey at ñ7. White Balanceò





※ **After You finish all adjustments, Press "In-start" button and compare Tool option and Area option value with its BOM, if it is correctly same then unplug the AC cable.**
If it is not same, then correct it same with BOM and unplug AC cable.
For correct it to the model's module from factory JIG model.

※ **Push the "IN-STOP KEY" after completing the function inspection.**

4.2 DDC EDID Write (RGB 128Byte)

y Connect D-sub Signal Cable to D-Sub Jack.

y Write EDID DATA to EEPROM (24C02) by using DDC2B protocol.

y Check whether written EDID data is correct or not.

*** For SVC main Ass'y, EDID have to be downloaded to Insert Process in advance.**

4.3 DDC EDID Write (HDMI 256Byte)

y Connect HDMI Signal Cable to HDMI Jack.

y Write EDID DATA to EEPROM(24C02) by using DDC2B protocol.

y Check whether written EDID data is correct or not.

*** For SVC main Ass'y, EDID have to be downloaded to Insert Process in advance.**

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4.5 EDID DATA

1) All Data : HEXA Value

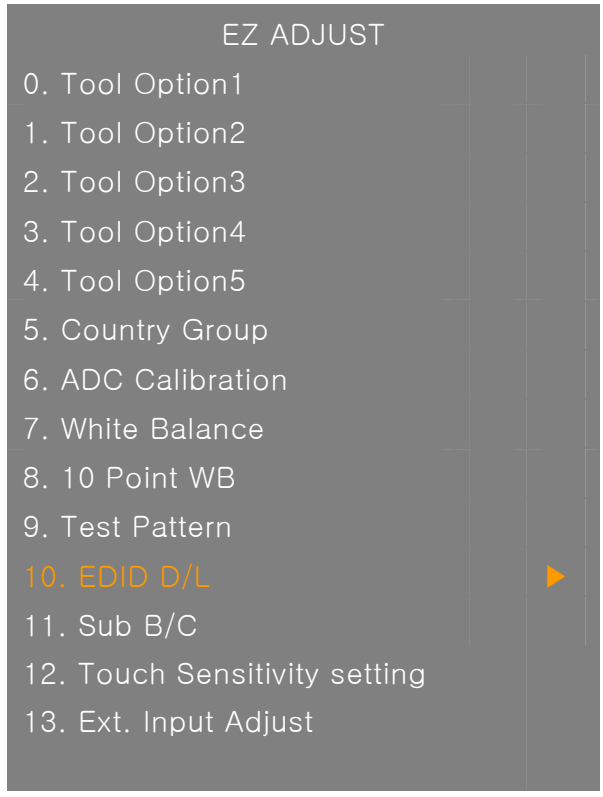
2) Changeable Data :

*: Serial No : Controlled / Data:01

**: Month : Controlled / Data:00

***:Year : Controlled

****:Check sum

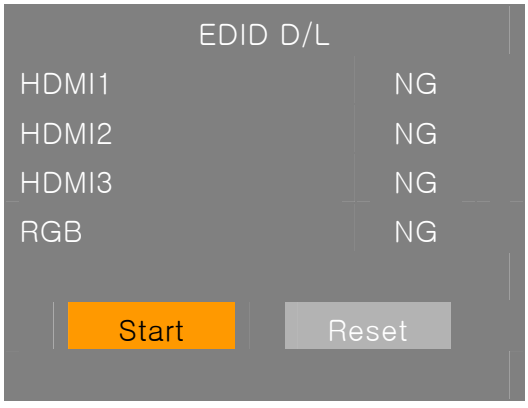


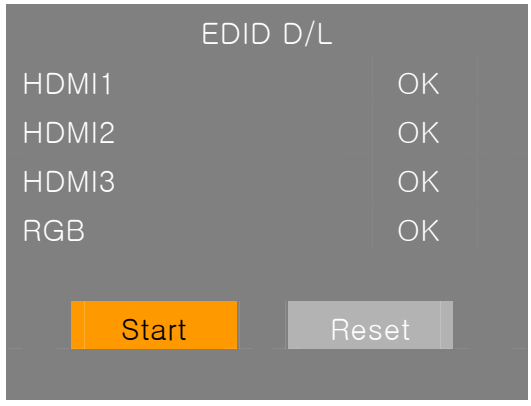
- Auto Download

- After enter Service Mode by pushing "**ADJ**" key,
- Enter **EDID D/L** mode.
- Enter "START" by pushing "OK" key.

Caution : Never connect HDMI & D-sub Cable when EDID downloaded.

※ LS4100, LS3500 and CS460 series have only two HDMI.





※ EDID data and Model option download (RS232)

NO	Item	CMD 1	CMD 2	Data 0		
Enter download MODE	Download "Mode In"	A	A	0	0	When transfer the "Mode In", Carry the command.
EDID data and Model option download	Download	A	E	00	10	Automatically download (The use of a internal Data)

- Manual Download

※ Caution

* Use the proper signal cable for EDID Download
  - Analog EDID : Pin3 exists
  - Digital EDID : Pin3 exists

- Never connect HDMI & D-sub Cable at the same time.

- Use the proper cables below for EDID Writing.

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- Download HDMI1/2/3 separately because each EDID data is different.

For Analog EDID	For HDMI EDID	
D-sub to D-sub	**DVI-D to HDMI or HDMI to HDMI**	

No.	Item	Condition	Hex Data
1	Manufacturer ID	GSM	1E6D
2	Version	Digital : 1	01
3	Revision	Digital : 3	03

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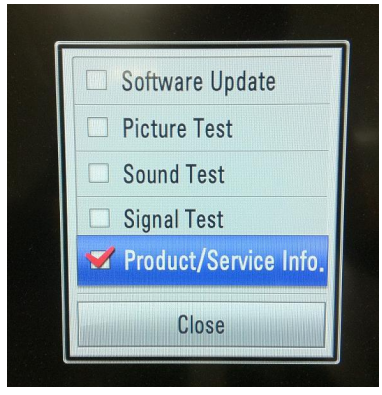
※ **Model information**

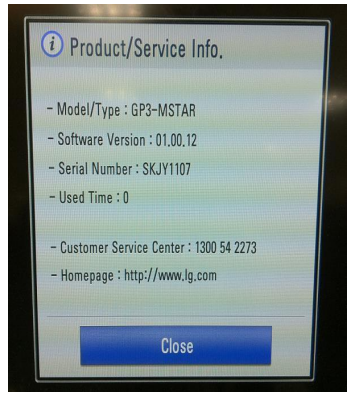
Model	BLU	Freq.	Resolution
47LS4100-CA	Edge LED	60Hz	FHD (8bit)
42LS4100-CA	Edge LED	60Hz	FHD (8bit)
32LS3500-CA	Edge LED	60Hz	HD (8bit)
42CS460-CB	EEFL	60Hz	FHD (10bit)
32CS460-CB	EEFL	60Hz	HD (8bit)
42LM3400-CC	Direct LED	60Hz	FHD(10bit)
42LM3100-CC	Direct LED	60Hz	FHD(8bit)
32LM3100-CC	Direct LED	60Hz	HD(8bit)
55LM4600-CC	Edge LED	60Hz	FHD (8bit)
47LM4600-CC	Edge LED	60Hz	FHD (8bit)

4.5 Model name & Serial number Download

4.5.1 Model name & Serial number D/L

- Press ñPower onò key of service remocon.(Baud rate : 115200 bps)
- Connect USB to RS232 cable at USB Jack.
- Write model name and serial number.
- Must check the model name and serial number at the Product/Service Info.
  (menu key→ red key → select Product/Service info)





4.5.2 Signal TABLE

CMD	LENGTH	ADH	ADL	DATA_1	. . .	Data_n	CS	DELAY

CMD : A0h
LENGTH : 85~94h (1~16 bytes)
ADH : EEPROM Sub Address high (00~1F)
ADL : EEPROM Sub Address low (00~FF)
Data : Write data
CS : CMD + LENGTH + ADH + ADL + Data_1 + é + Data_n

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Delay : 20ms

4.5.3 Command Set

No.	Adjust mode	CMD(hex)	LENGTH(hex)	Description
1	EEPROM WRITE	A0h	84h+n	n-bytes Write (n = 1~16)

* Description

FOS Default write : <7mode data> write

Vtotal, V_Frequency, Sync_Polarity, Htotal, Hstart, Vstart, 0, Phase
Data write : Model Name and Serial Number write in EEPROM,.

4.5.4 Method & notice

A. Serial number D/L is using of scan equipment.
B. Setting of scan equipment operated by Manufacturing Technology Group.
C. Serial number D/L must be conformed when it is produced in production line, because serial number D/L is mandatory by D-book 4.0

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※ **Manual Download (Model Name and Serial Number)**

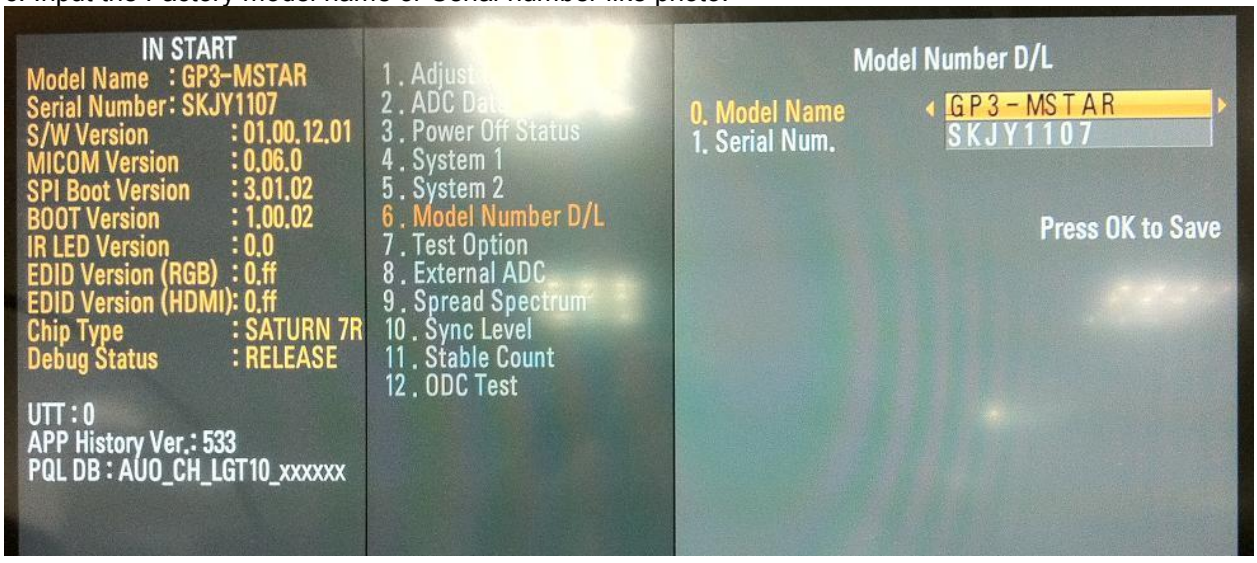
If the TV set is downloaded By OTA or Service man, Sometimes model name or serial number is initialized.(Not always)

It is impossible to download by bar code scan, so It need Manual download.

a. Press the ónstartôkey of ADJ remote controller.

b. Go to the menu ó**6.Model Number D/L**ôlike below photo.

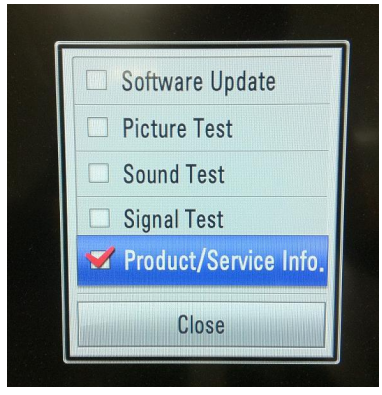
c. Input the Factory model name or Serial number like photo.

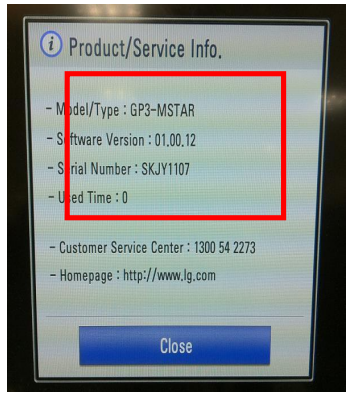


d. Check the model name Instart menu → Factory name displayed.

e. Check the Product/Service Info. (Menu Key→ Red Key → Select Product/Service Info.)

→ Buyer model displayed.





4.5.5 Outgoing condition Configuration

y When pressing **IN-STOP key** by SVC remocon, Red LED are blinked alternatively. And then automatically turn off.

(Must not AC power OFF during blinking)

4.6 Hi-Pot Test

Confirm whether is normal or not when between power board's ac block and GND is impacted on 1.5kV(dc) or 2.2kV(dc) for one second.

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5. Preset CH Information

If you turn on TV by pushing the '**POWER ON**' or '**P-ONLY**' key, TV catch the channel 10 DTV, 1 CADTV, 12 ATV and

2 CATV channels on line condition. Pr.2~4 of CADTV will be updated after changing channel to CADTV channel 1.

DTV Ch name is displayed below initially, but if you do channel tuning just one time, you can see DTV Ch name.

Total = 25(+3) Channels

◈ DTV : **MUX No. in '( )' is used for Hong Kong DTV.**

MUX	Pr.	Name	CH information			Factory
15 (23)	1(82)	J2	SD	16 : 9	576i	GUMI
	2(83)	Interactive Information	SD	16 : 9	576i	GUMI
	3(85)	High Definition Jade	HD	16 : 9	1080i	GUMI
16 (24)	4(900)	CCTV-1	SD	4 : 3	576i	LGEND
	5(901)	CCTV-2	SD	4 : 3	576i	LGEND
	6(902)	CCTV-少儿	SD	4 : 3	576i	LGEND
	7(903)	CCTV-音乐	SD	4 : 3	576i	LGEND
	8(904)	BTV-1	SD	4 : 3	576i	LGEND
	9(905)	CETV-3	SD	4 : 3	576i	LGEND
20 (28)	10(906)	CCTV–高清	HD	16 : 9	1080i	LGEND

◈ CADTV : **MUX No. in '( )' is used for Hong Kong DTV.**

MUX	Pr.	Name	CH information			Factory
55 (63)	1	CCTV-4	SD	4 : 3	576i	LGEND
	2	CCTV-9	SD	4 : 3	576i	LGEND
	3	CCTV F	SD	4 : 3	576i	LGEND
	4	CCTV E	SD	4 : 3	576i	LGEND

(Pr.2~4 of CADTV will be updated automatically after changing channel to Pr.1)

◈ ATV

Pr	System		Band	Name	CH	Freq.	Factory
1	PAL	DK	V/UHF	D-10	C 10	200.25	LGEND/GUMI
2	PAL	DK	V/UHF	K-36	C 36	695.25	LGEND/GUMI
3	PAL	I	V/UHF	I-05	C 05	183.25	GUMI
4	PAL	I	V/UHF	I-11	C 11	231.25	GUMI
5	PAL	I	V/UHF	I-41	C 41	631.25	GUMI
6	PAL	I	V/UHF	I-63	C 63	807.25	GUMI
7							
8							
9							
10							
11							
12							

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◈ CATV

Pr	System		Band	Name	CH	Freq.	Factory
1	PAL	DK	V/UHF	-	C 02	57.75	LGEND
2	NTSC	M	V/UHF	-	C 04	67.25	GUMI

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6. Shipping condition

No.	Item	Condition	Remark		
1.	Power	Off			
2.	Mechanical Power switch	On			
3.	Volume Level	10			
4.	Main Picture Input	DTV	DTV & ATV		
5.	Main Last Channel	N.A.			
6.	Mute	Off			
7.	ARC	16:9 (DTV)			
8	SETUP	Auto Tuning			
		Manual Tuning	DTV / TV / CADTV / CATV		
		Programme Edit	DTV / RADIO / TV / Cable DTV / Cable Radio / Cable TV	*** Only Hong Kong : DTV / RADIO /TV / Cable TV**	
		Booster	Off		
		CI Information		***Except Hong Kong**	
		Cable DTV setting	Service Operator	others	
			Audio Auto Mode	On	
9.	PICTURE	Aspect Ratio	16:9		
		Picture Wizard			
		Energy Saving	Off		
		Picture Mode	Intelligent Sensor		
			Vivid		
			Backlight	100	
			Contrast	95	
			Brightness	50	
			Sharpness	70	
			Colour	70	
			Tint	0	
			Colour Temp	C50	
			Advanced	Dynamic Contrast	High
				Dynamic Colour	High
				Clear White	High
				Skin color	0

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			Control	Noise Reduction	Medium
				Digital Noise Reduction	Medium
				Gamma	Medium
				Black level	Auto
				Eye Care	Low
				Real Cinema	On
				Color Gamut	Wide
				xvYCC	Off
			Picture Reset		
		TruMotion	**Low**	**Only LM5700**	
		Screen	Resolution		
			Auto Config.		
			Position		
			Size		
			Phase		
			Reset		
10.	AUDIO	Auto Volume	Off		
		Clear Voice II	Off	On Level 3	
		Balance	0		
		Sound Mode	Standard		
			Infinite Sound	Off	
			Treble	50	
			Bass	50	
			Reset		
		Digital Audio out	PCM	PCM/Auto	
		TV Speaker	ON	ON/Off	
		DTV Audio Setting	Auto	Auto/AAC/Dolby Digital+/Dolby Digital/MPEG;	
11.	Time	Clock	-- : --	Auto	
		Off time	Off		
		On time	Off		

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		Sleep Timer	Off		
12.	LOCK	Set Password			
		Lock System	Off		
		Key Lock	Off-		
13.	OPTION	Language	Menu Language	汉语	*** Mainland China**
				中文	*** Hong Kong**
			Audio language	Mandarin(普通话)	*** Mainland China**
				Cantonese(廣東语)	*** Hong Kong**
			Subtitle Language	Mandarin(普通话)	*** Mainland China**
				Cantonese(廣東语)	*** Hong Kong**
		City/Area	--	*** Mainland China/Hong Kong**	
		Hard of hearing	Off	***Off/ON**	
		Power Indicator	Standby Light : On Power Light : On		
		MHEG Guide	Off	*** Only Hong Kong**	
		Factory Reset			
		Mode Setting	Home Use		

7. Additional Rules

This specification goes into effect from 2011/12/12.

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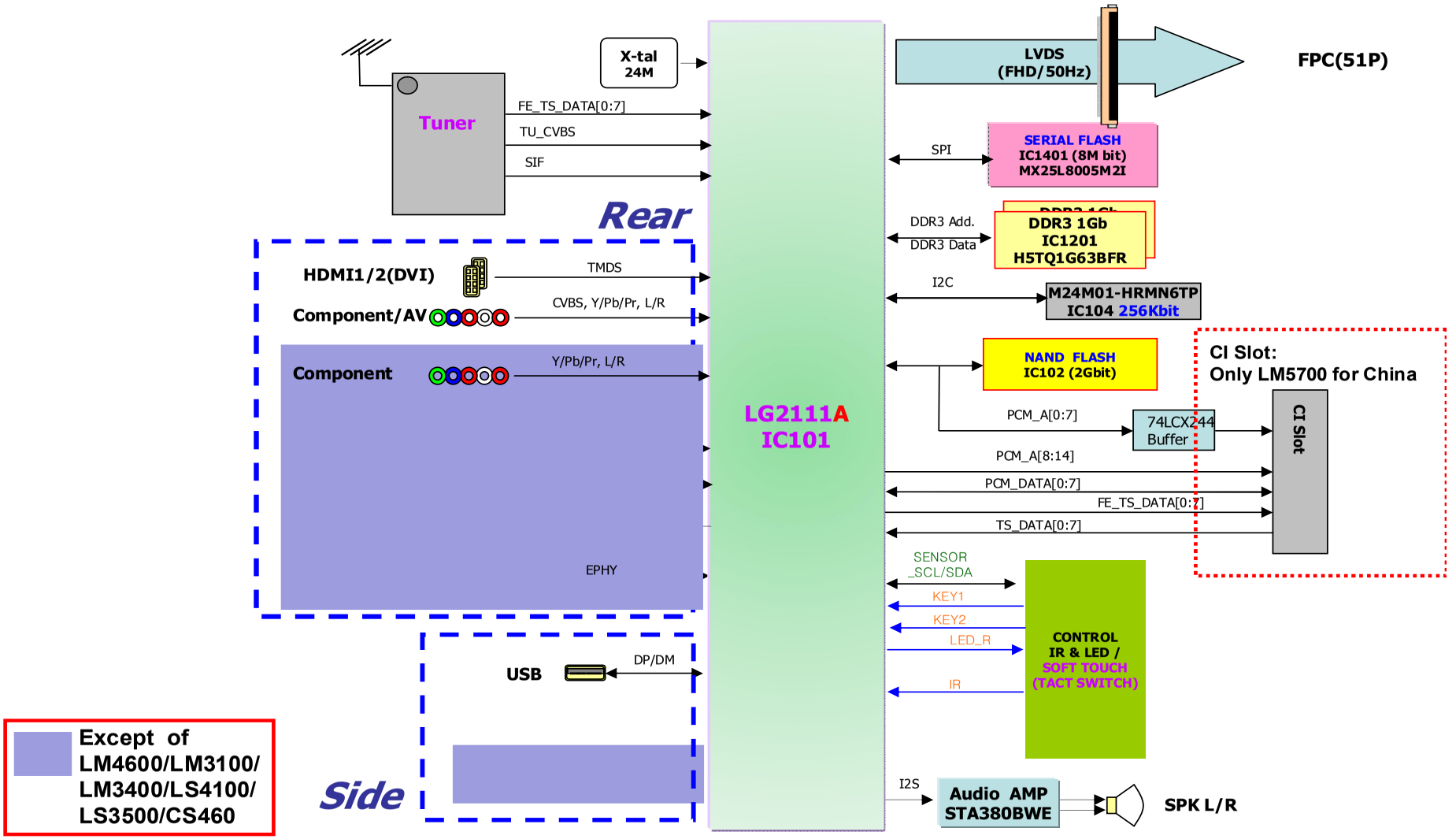
Block Diagram



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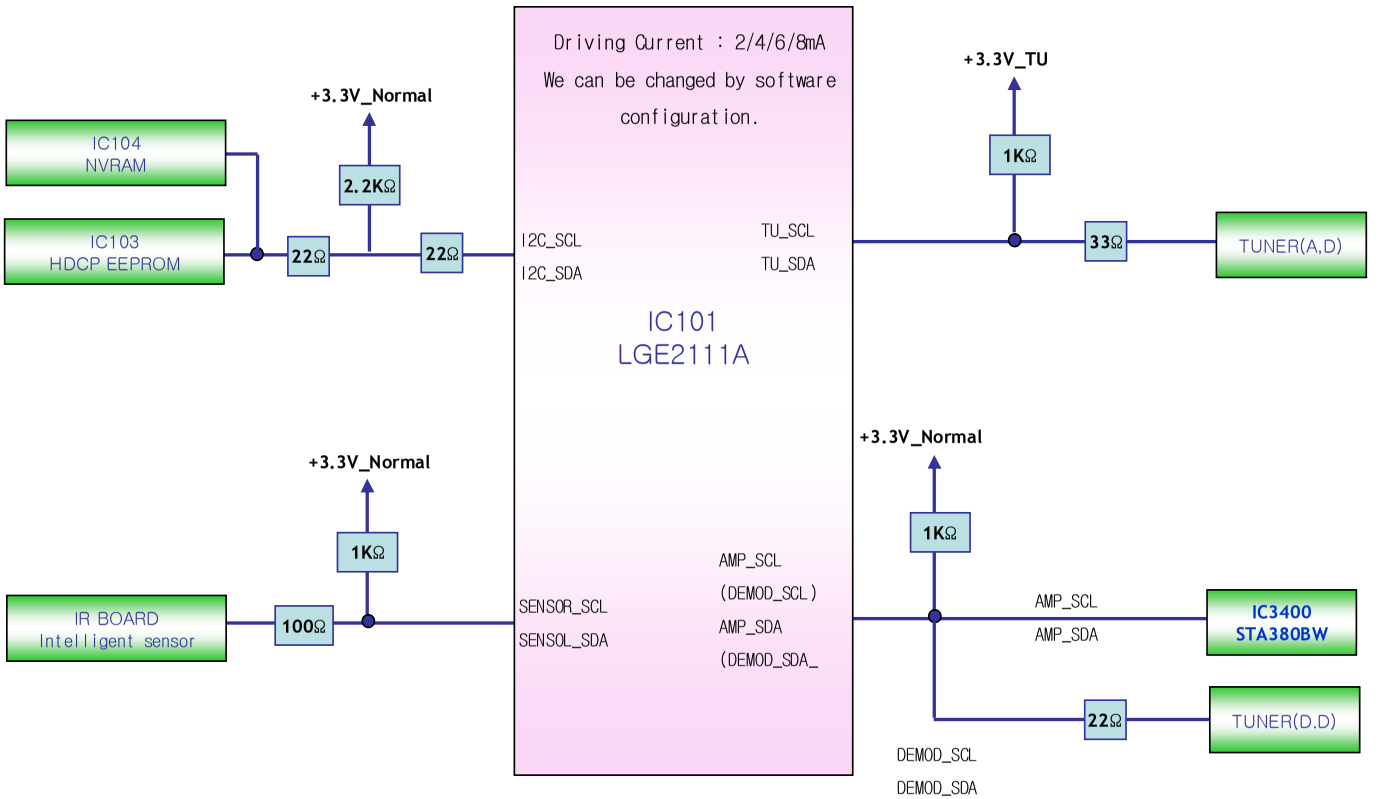
I2C MAP (LGE2112)



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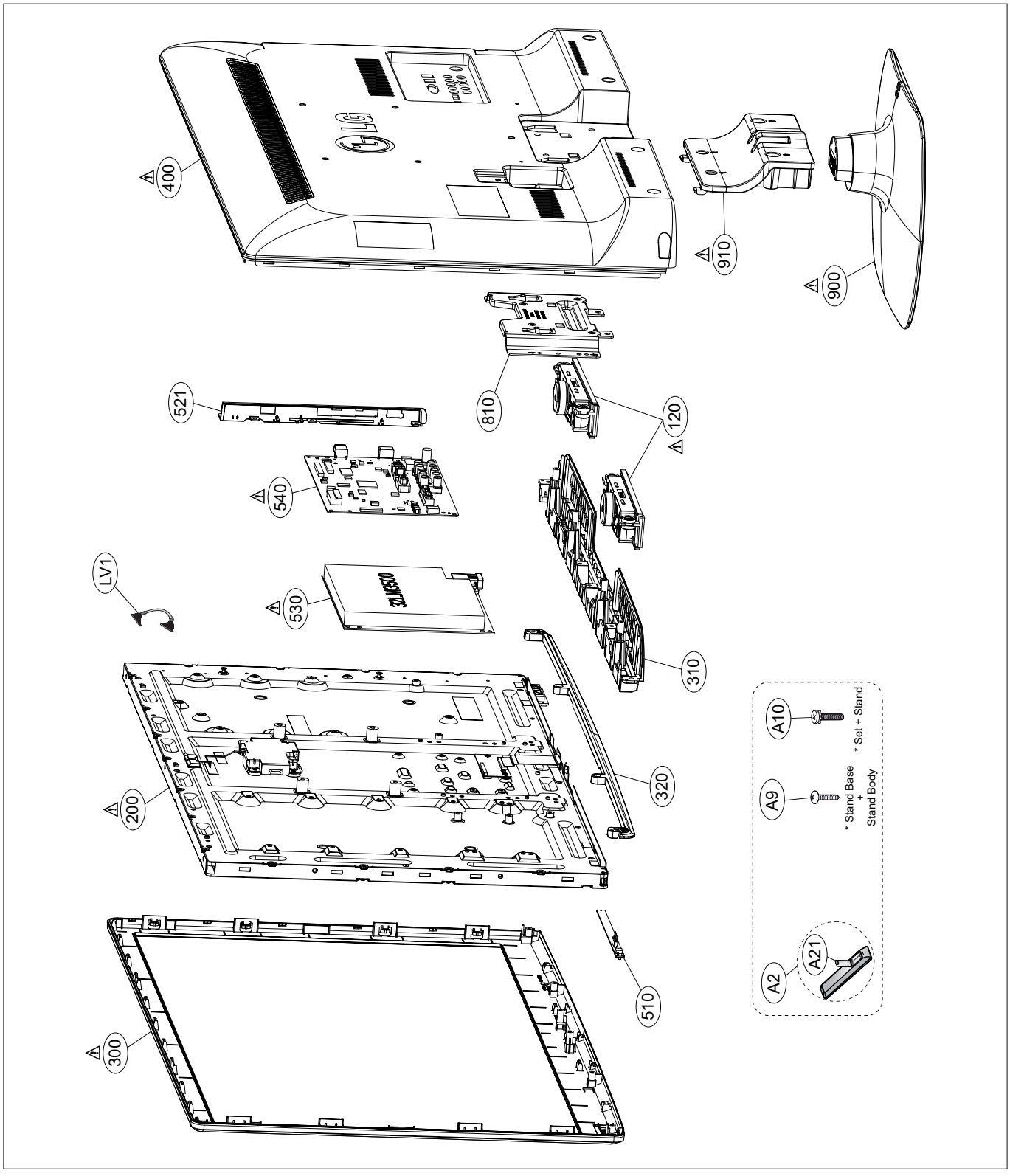
EXPLODED VIEW

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and EXPLODED VIEW.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.



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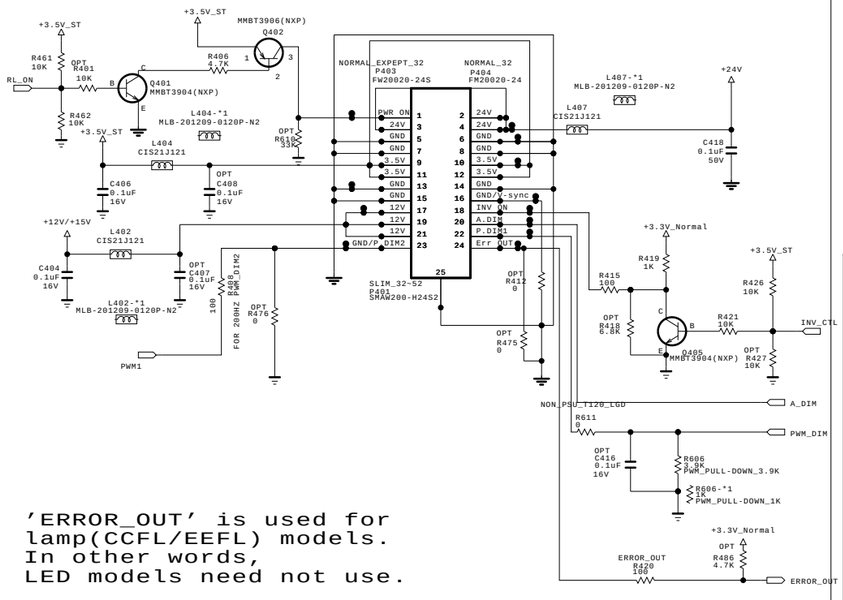
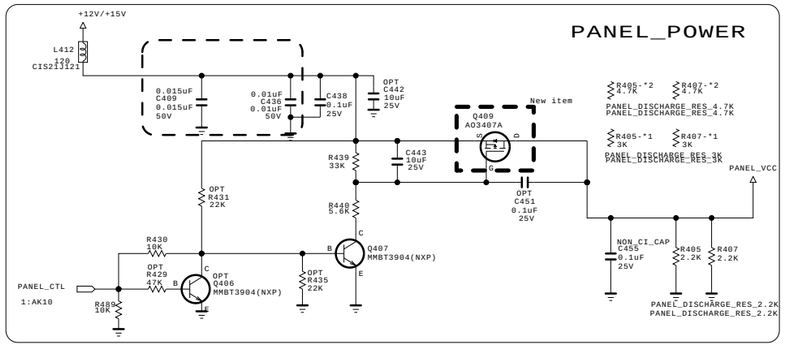
FROM LIPS & POWER B/D

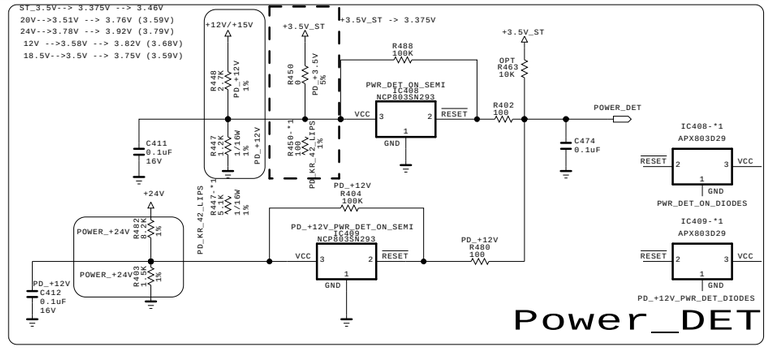


'ERROR_OUT' is used for lamp(CCFL/EEFL) models.
In other words,
LED models need not use.

PANEL_POWER

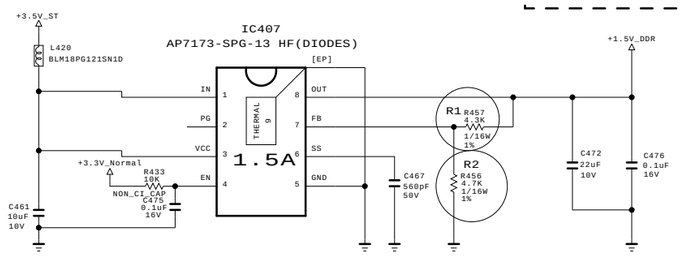


Power_DET



+1.5V_DDR

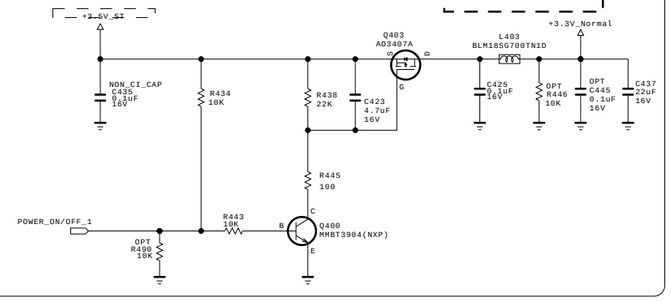
Max 1000mA



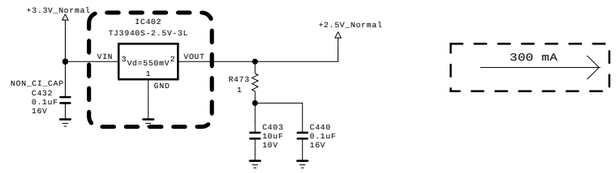
Vout=0.8*(1+R1/R2)=1.5319

+3.3V_Normal

780 mA

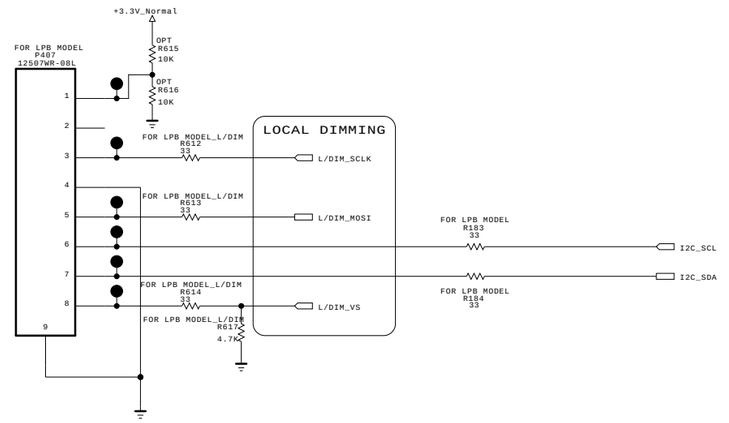


+2.5V/+1.8V



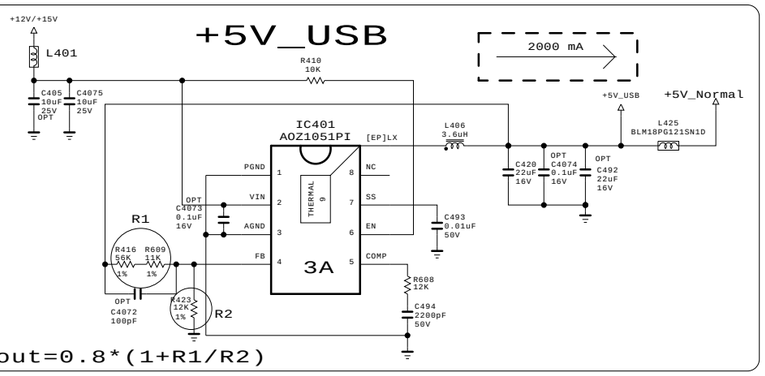
FOR LPB Download

[To LED DRIVER]



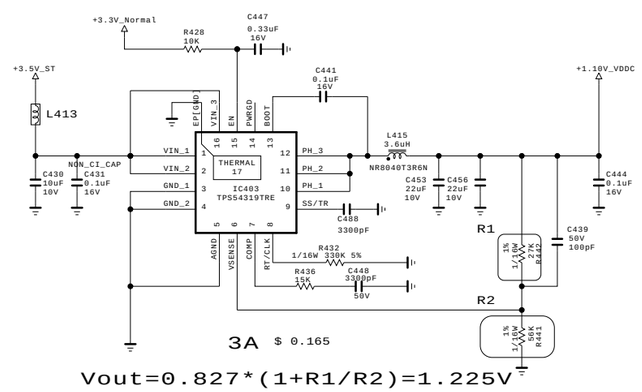
+5V_USB

2000 mA



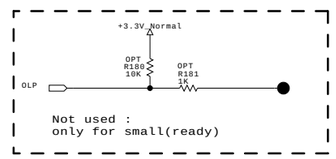
Vout=0.8*(1+R1/R2)

S7LR core 1.2V volt



Vout=0.827*(1+R1/R2)=1.225V

OLP



Not used :
only for small(ready)

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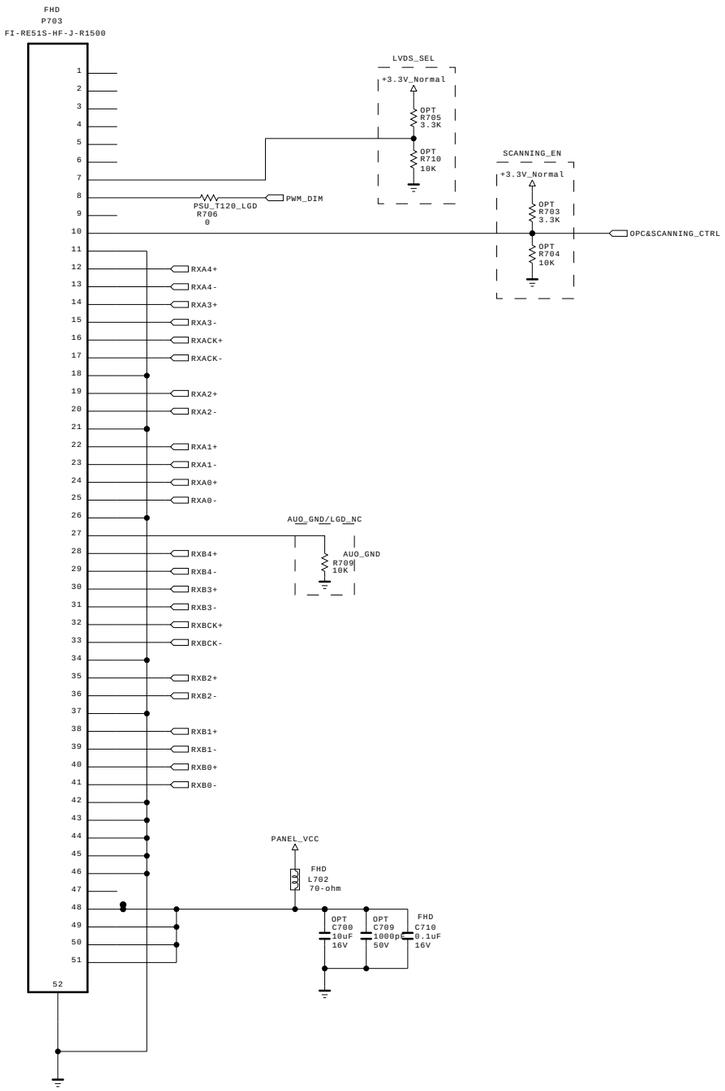
LG ELECTRONICS

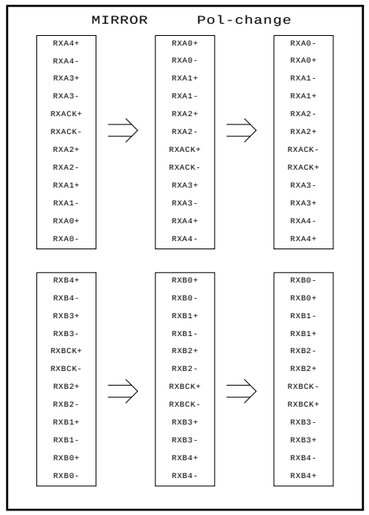
MODEL	GP4L_S7LR2	DATE	2011/11.22
BLOCK	POWER_LARGE	SHEET	4

LVDS for large inch

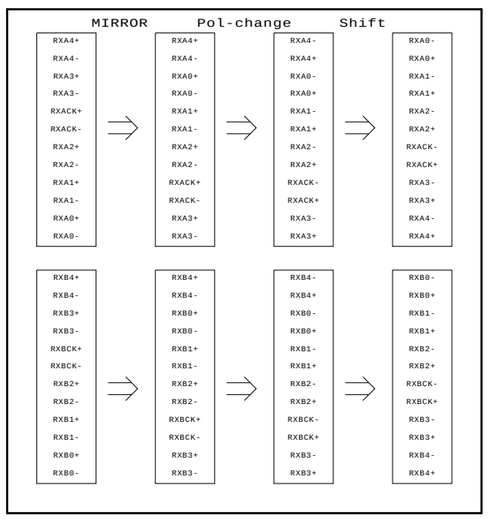
[51Pin LVDS Connector] (For FHD 60Hz)



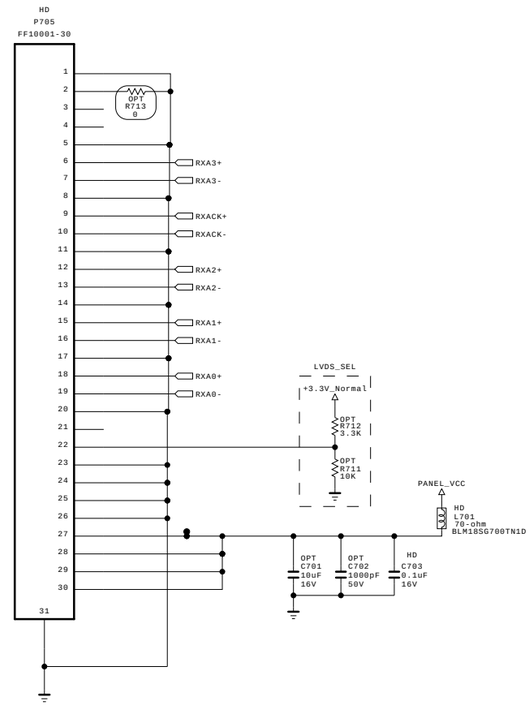
FOR FHD REVERSE(10bit) Change in S7LR



FOR FHD REVERSE(8bit) Change in S7LR



[30Pin LVDS Connector] (For HD 60Hz_Normal)



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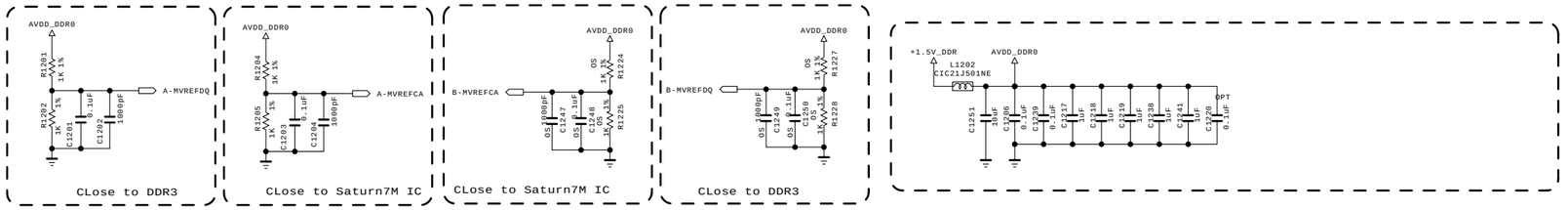
LG ELECTRONICS

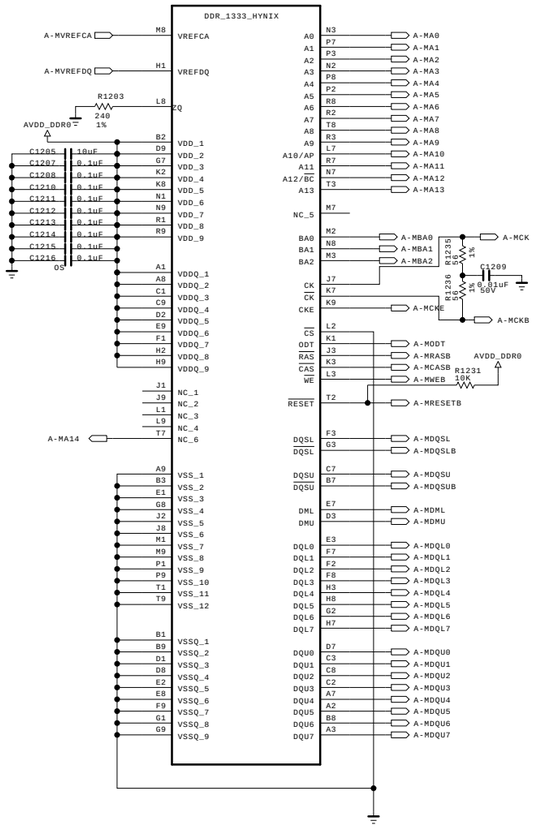
MODEL	GP4L_S7LR2	DATE	2011/11/14
BLOCK	LVDS_LARGE	SHEET	11



EAN61828901

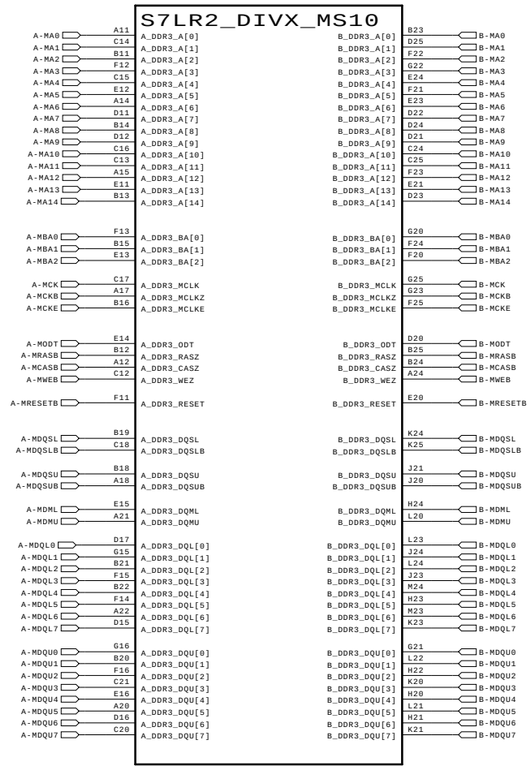
IC1201 H5TQ1G63DFR-H9C

DDR_1333_HYNIX



IC101 LGE2111A-T8

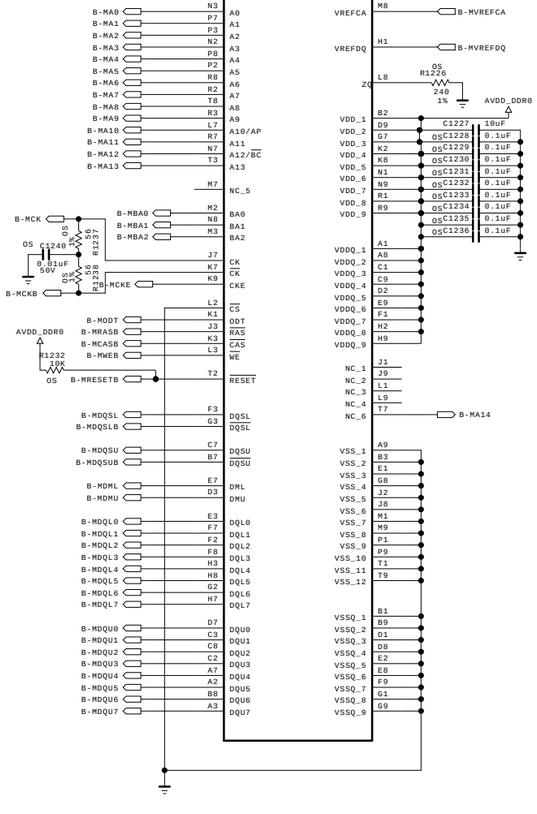
S7LR2_DIVX_MS10



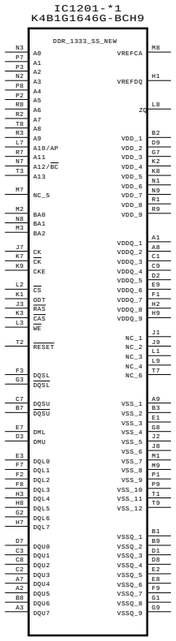
EAN61828901

IC1202 H5TQ1G63DFR-H9C

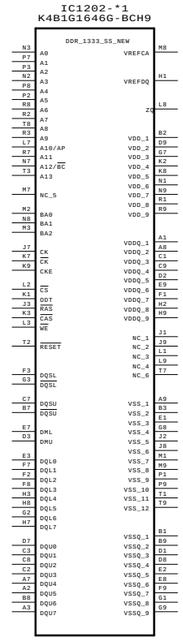
DDR_1333_HYNIX



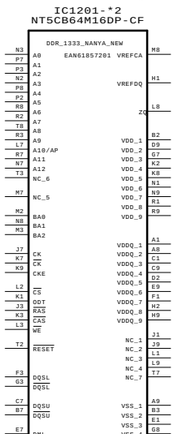
IC1201-*1 K4B1G1646G-BCH9



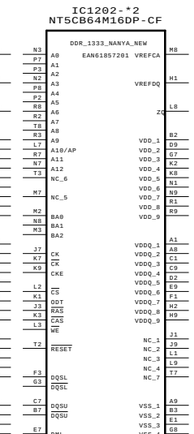
IC1202-*1 K4B1G1646G-BCH9



IC1201-*2 NT5CB64M16DP-CF



IC1202-*2 NT5CB64M16DP-CF



DDR_1600_SS IC1201-*1 K4B1G1646G-BCH9

DDR_1600_SS IC1202-*1 K4B1G1646G-BCH9

DDR_1600_HYNIX IC1201-*3 H5TQ1G63DFR-PBC

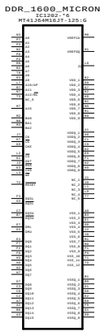
DDR_1600_HYNIX IC1202-*3 H5TQ1G63DFR-PBC

DDR_DVB_T2_2G IC1201-*4 K4B2G1646C

DDR_DVB_T2_2G IC1202-*4 K4B2G1646C

DDR_1600_MICRON IC1201-*5 MT41J64M16JT-125:G

DDR_1600_MICRON IC1202-*5 MT41J64M16JT-125:G



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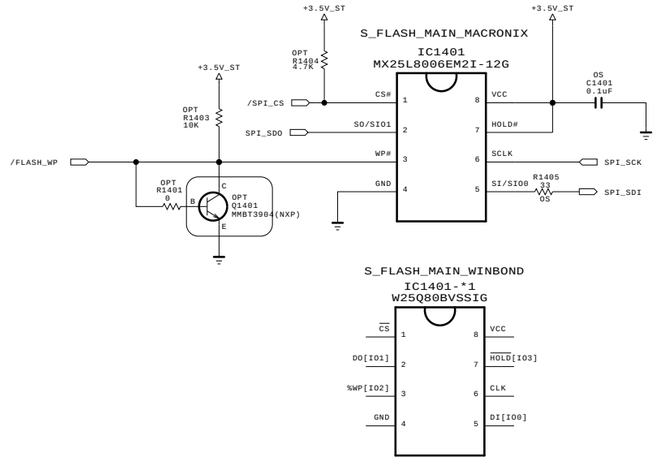
LG ELECTRONICS

MODEL	GP4L_S7LR2	DATE	2011/06/03
BLOCK	DDR_256	SHEET	12

Serial Flash for SPI boot



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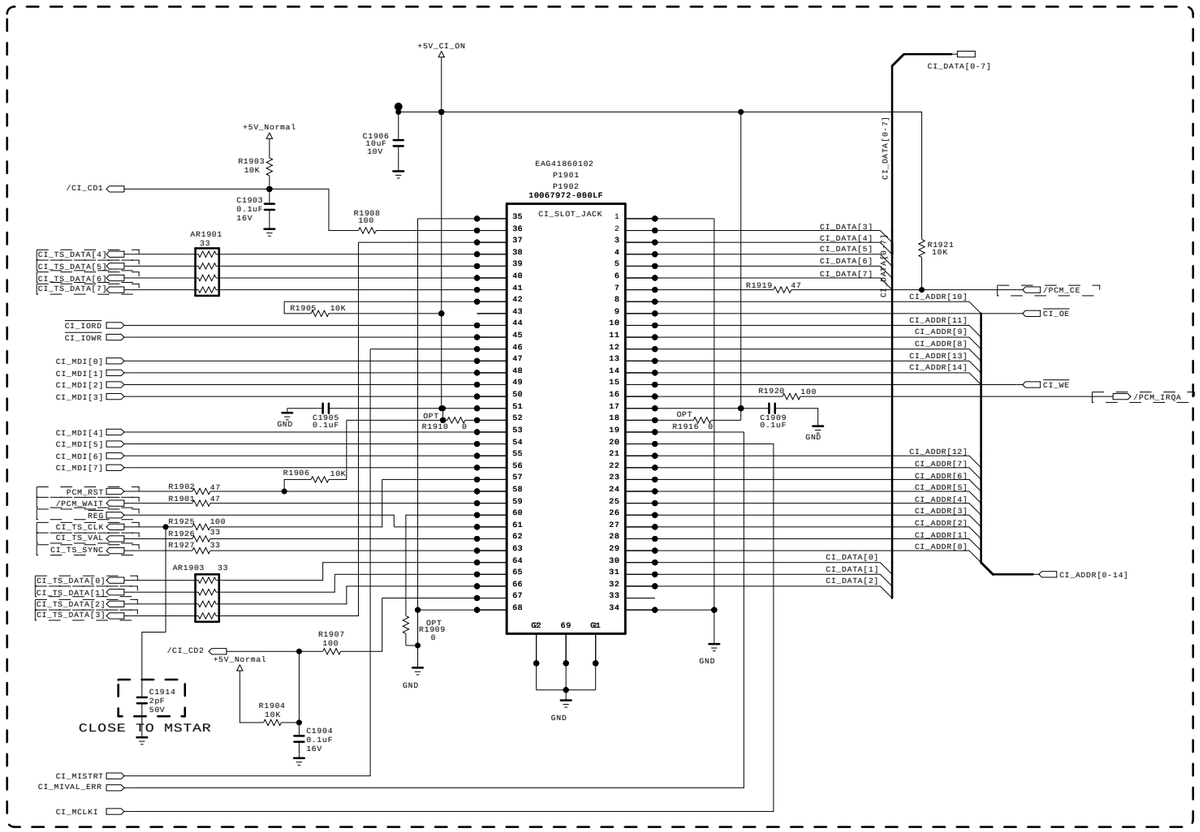
LG ELECTRONICS

MODEL	GP4L_S7LR2	DATE	2011/06/03
BLOCK	SFLASH_1MB	SHEET	13

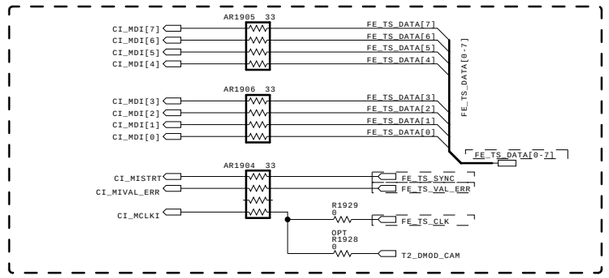
CI Region

* Option name of this page : CI_SLOT
(because of Hong Kong)

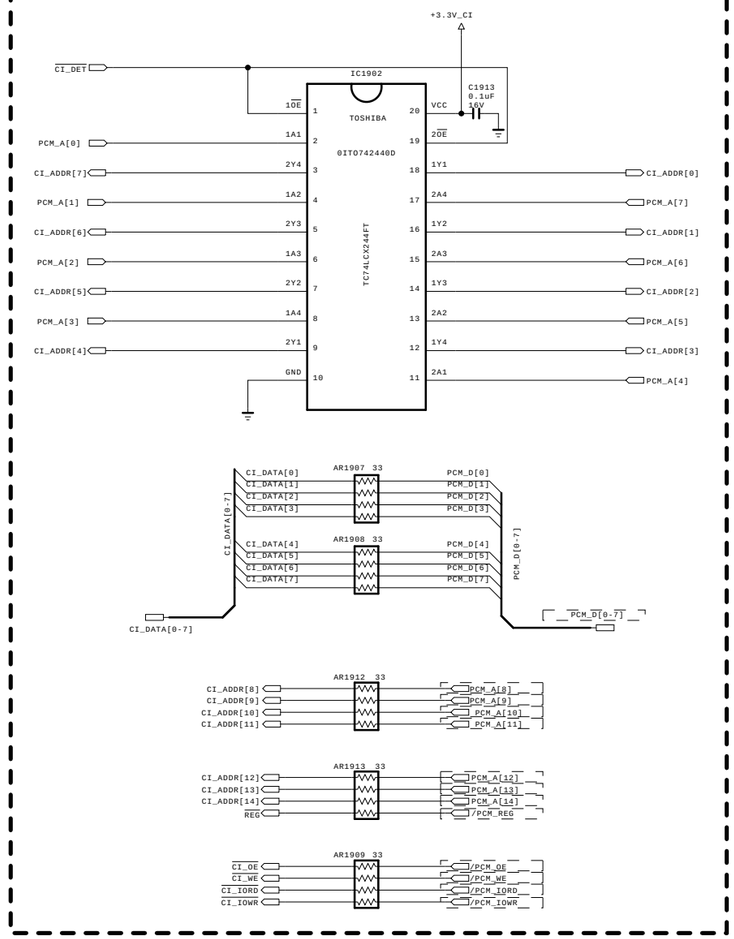
CI SLOT

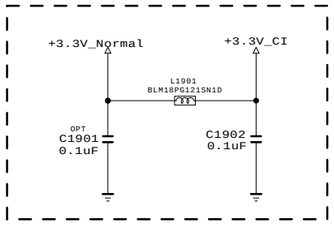


CI TS INPUT

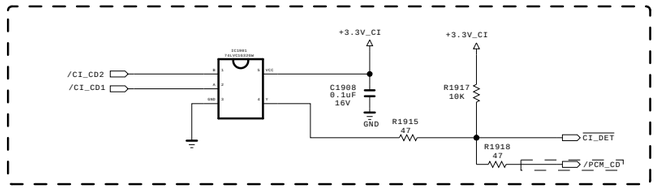


CI HOST I/F

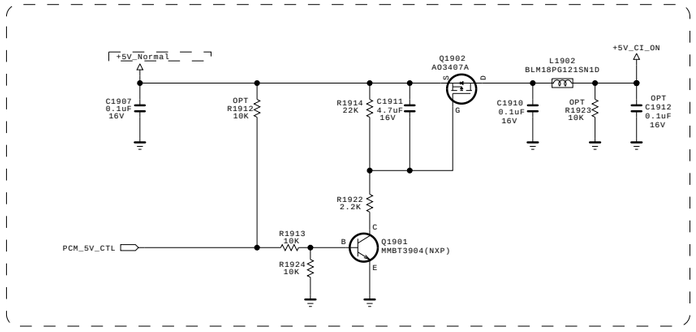




CI DETECT



CI POWER ENABLE CONTROL



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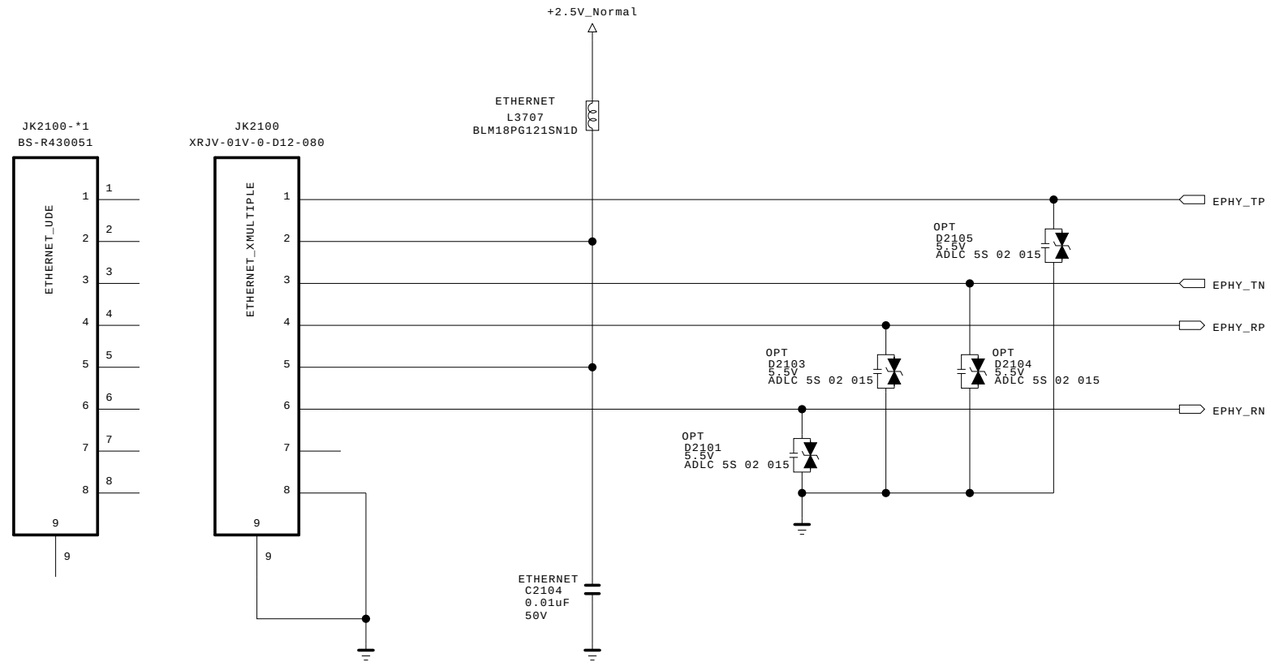
LG ELECTRONICS

MODEL	GP4L_S7LR2	DATE	11/08/13
BLOCK	PCMCI	SHEET	19

ETHERNET

* H/W option : ETHERNET



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SECRET

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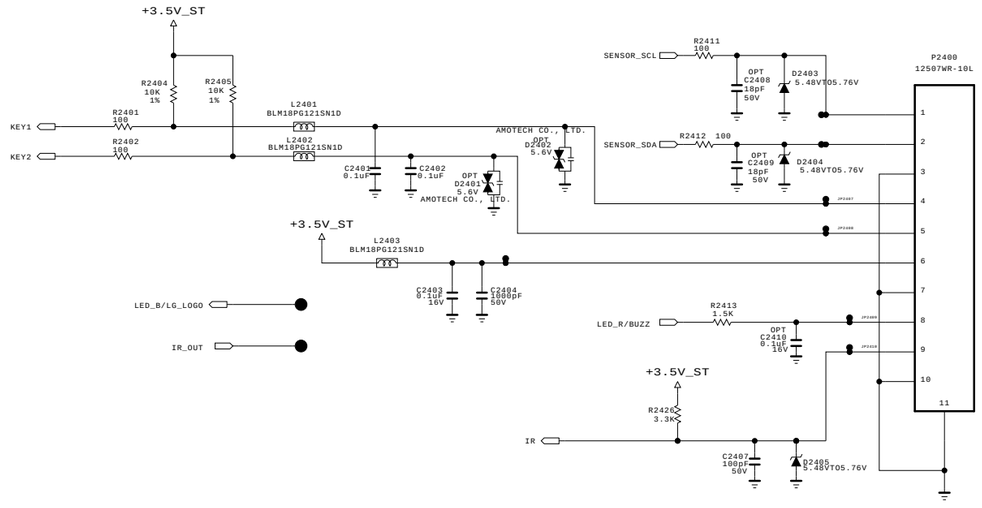
LG ELECTRONICS

MODEL	GP4L_S7LR2	DATE	2011/06/14
BLOCK	ETHERNET	SHEET	21

IR/LED and control for on.y ’12 sub without IR-OUT.



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LG ELECTRONICS

MODEL	GP4L_S7LR2	DATE	2011/08/17
BLOCK	IR/CONTROL_W/O_IR_OUT	SHEET	23

GP4R_GLOBAL_TUNER_BLOCK

TU_T/C
TU2602
TDSS-G101D

TU_T2/C
TU2603
TDSN-G301D

TU_T/C/S2
TU2601
TDSQ-G001D

	TU_T/C	TU_T2/C	TU_T/C/S2
1	NC	NC_1	NC_1
2	RESET	RESET	RESET
3	SCL	SCL	SCL
4	SDA	SDA	SDA
5	+3.3V	+B1[3.3V]	+B1[3.3V]
6	SIF	SIF	SIF
7	+1.8V	+B2[1.8V]	+B2[1.8V]
8	CVBS	CVBS	CVBS
9	IF_AGC	NC_2	T/C_IF_AGC
10	DIF[P]	NC_3	T/C_DIF[P]
11	DIF[N]	NC_4	T/C_DIF[N]
12	SHIELD	+B3[3.3V]	NC_2
13		+B4[1.23V]	NC_3
14		NC_5	NC_4
15		GND	GND_1
16		ERROR	ERROR
17		SYNC	SYNC
18		VALID	VALID
19		MCLK	MCLK
20		D0	D0
21		D1	D1
22		D2	D2
23		D3	D3
24		D4	D4
25		D5	D5
26		D6	D6
27		D7	D7
28		SHIELD	GND_2
29			GND_3
30			+B3[1.23V]
31			S2_RESET
32			+B4[3.3V]
33			S2_F22_OUTPUT
34			S2_SCL
35			S2_SDA
36			LNB
37			GND_4
38			SHIELD

RF_SW_OPT R2603 0 — RF_SWITCH_CTL
RF_SW_OPT C2603 0.1uF 16V
Close to TUNER

+3.3V_TU
R2614 100K — TUNER_RESET
R2611 100
C2622 0.1uF 16V

GPIO must be added.

+3.3V_TU
R2870 1K
R2871 1K
R2609 33 — TU_SCL
R2610 33 — TU_SDA
C2607 20pF 50V
C2612 20pF 50V
C2651 20pF 50V
C2652 20pF 50V

+3.3V_TU
C2621 100pF 50V
C2623 0.1uF 16V
OPT R2615 0
C2620 0.1uF 16V
R2616 4.7K
Q2600 MMBT3906(NXP)
+3.3V_TU
R2618 470
R2619 82 — TU_SIF

+3.3V_TU
R2624 220
R2625 220
TU_CVBS
R2621 0
OPT R2622 1K
Q2601 MMBT3906(NXP)
close to TUNER

+1.8V_TU
OPT C2606 100uF 16V
+2.5V_TU
OPT R2607 0
C2602 100pF 50V
C2604 0.1uF 16V
C2600 0.1uF 16V
HALF_NIM/EU_NON_T2 R2608 0
IF_AGC_MAIN
should be guarded by ground

HALF_NIM/EU_NON_T2 R2602 0 — IF_P_MSTAR
HALF_NIM/EU_NON_T2 R2601 0 — IF_N_MSTAR
+3.3V_T2_TU
T2 R2606 0
T2 C2614 100pF 50V
T2 C2617 0.1uF 16V
T2 C2618 10uF 6.3V
+1.23V_TU
T2 L2601 BLM18PG121SN1D
OPT C2601 0.1uF 16V
close to TUNER
T2 C2616 0.1uF 16V
T2 C2620 0.1uF 16V

FULL_NIM_NON_S AR3701 47
FE_TS_ERR
FE_TS_SYNC
FE_TS_VAL
FE_TS_CLK
OPT R2676 0 — T2_DMOD_CAM

FULL_NIM_NON_S AR3702 47
FULL_NIM_NON_S AR3703 47
FE_TS_DATA[0]
FE_TS_DATA[1]
FE_TS_DATA[2]
FE_TS_DATA[3]
FE_TS_DATA[4]
FE_TS_DATA[5]
FE_TS_DATA[6]
FE_TS_DATA[7]
FE_TS_DATA[0-7]

AR3701-*1 33 1/16W DVB_S
AR3702-*1 33 1/16W DVB_S
AR3703-*1 33 1/16W DVB_S

+1.23V_TU
DVB_S L2600 BLM18PG121SN1D
DVB_S C2608 100pF 50V
DVB_S C2611 0.1uF 16V
DVB_S C2615 10uF 10V
+1.23V_TU
DVB_S R2612 2.2K
DVB_S R2613 10
S2_RESET
DVB_S C2619 0.1uF 16V
+3.3V_S2_DE
DVB_S C2624 100pF 50V
DVB_S C2625 0.1uF 16V
DVB_S R2606 22 — DEMOD_SCL
DVB_S R2604 22 — DEMOD_SDA
OPT C2610 18pF 50V
OPT C2613 18pF 50V
DVB_S_FILTER R2875-*1 MLB-201209-0120P-N2
close to TUNER
DVB_S_NON_FILTER R2875 0
Surge protection
OPT C2649 18pF 50V
DVB_S C2650 18pF 50V
OPT C2605 33pF 50V
DVB_S C2609 33pF 50V
DVB_S D2600 3.0SMCJ20A(suzhougrande)
DVB_S R2874 2.2K 1W
LNB_OUT
Pull-up can't be applied because of MODEL_OPT_2

DVB_S R2600 51 — LNB_TX

ERROR & VALID PIN
OPT IC2601 74LVC1G08GW
FE_TS_VAL — OPT R2627 0
FE_TS_ERR
+3.3V_TU
OPT C2640 0.1uF 16V
OPT R2631 0 — FE_TS_VAL_ERR
R2628 0

Close to the tuner
DEMOD_RESET
This was being applied to the only china demod, so this has to be deleted in both main and ISDB sheet.
IF_AGC_SEL
LNA2_CTL
+3.3V_TU
IC2603 AP1117E18G-13
INADJ/GND
OUT
+1.8V_TU
R1
OPT R2873 200 1%
R2872 0
R2
R2632 1
C2641 0.1uF 16V
C2642 10uF 10V
Vo=VREF*(1+R2/R1)
VREF=1.25V
FULL_NIM IC2602 TJ4220GDP-ADJ [EP]GND
Vo=0.8*(1+R2/R1)
+1.23V_TU
NC_1
EN2
VIN3
NC4
GND
ADJ/SENSE
VOUT
NC_2
FULL_NIM R2629 3.3K
C2635 0.1uF 16V
FULL_NIM R2633 12K 1% R2
FULL_NIM R2634 22K 1% R1
FULL_NIM C2645 0.1uF 16V
FULL_NIM C2647 10uF 10V

TU_CHINA
TU2603-*1
TDSN-C201D

1	RF_S/W_CTL
2	RESET
3	SCL
4	SDA
5	+B1[3.3V]
6	SIF
7	+B2[1.8V]
8	CVBS
9	NC_1
10	NC_2
11	NC_3
12	+B3[3.3V]
13	+B4[1.23V]
14	NC_4
15	GND
16	ERROR
17	SYNC
18	VALID
19	MCLK
20	D0
21	D1
22	D2
23	D3
24	D4
25	D5
26	D7
27	D8
28	SHIELD

+3.3V_TU
OPT IC2600 AP2114H-2.5TRG1 (VIN VOUT GND)
OPT C2627 0.1uF 16V
+2.5V_TU
OPT R2620 1 1/16W 5%
OPT C2628 10uF 10V
OPT C2629 0.1uF 16V

+3.3V_TU
DVB_S L2602 BLM18PG121SN1D
C2630 0.1uF 16V
DVB_S C2632 10uF 10V
+3.3V_S2_DE
DVB_S C2634 0.1uF 16V
+3.3V_T2_TU
T2 L2603 BLM18PG121SN1D
T2 C2631 10uF 10V
T2 C2633 0.1uF 16V

+3.3V_TU
L2606 CIS21J121
C2643 22uF 10V
C2644 0.1uF 16V
+3.3V_Normal
C2646 22uF 10V
C2648 0.1uF 16V

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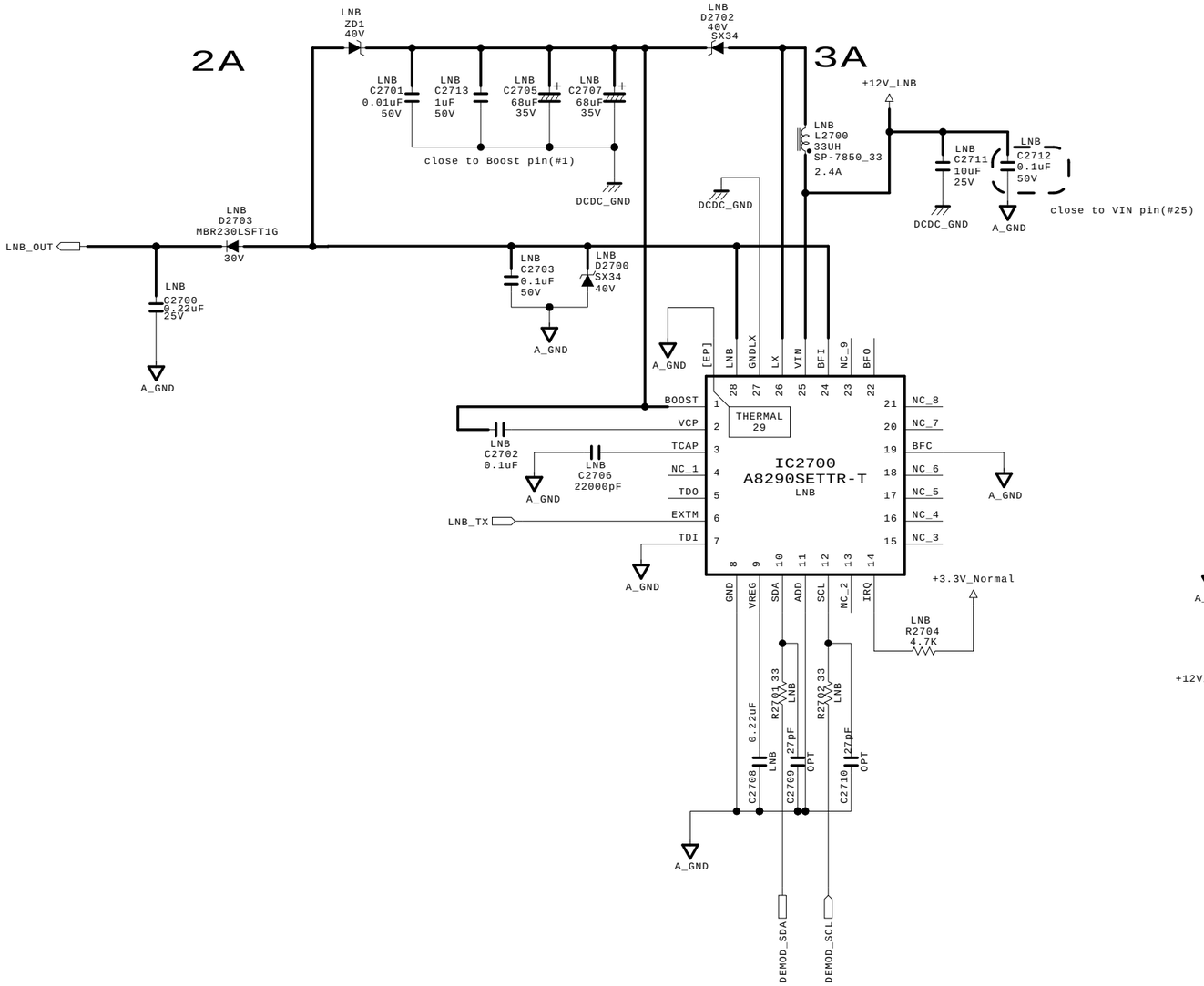
SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP4L_S7LR2	DATE	2011/12/09
BLOCK	TUNER_EU	SHEET	26

DVB-S2 LNB Part Allegro

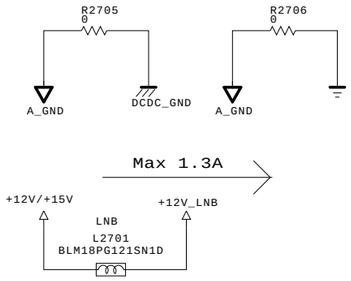
(Option:LNB)



DCDC_GND and A_GND are connected
DCDC_GND and A_GND are connected in pin#27
PCB_GND and A_GND are connected

Input trace widths should be sized to conduct at least 3A

Ouput trace widths should be sized to conduct at least 2A



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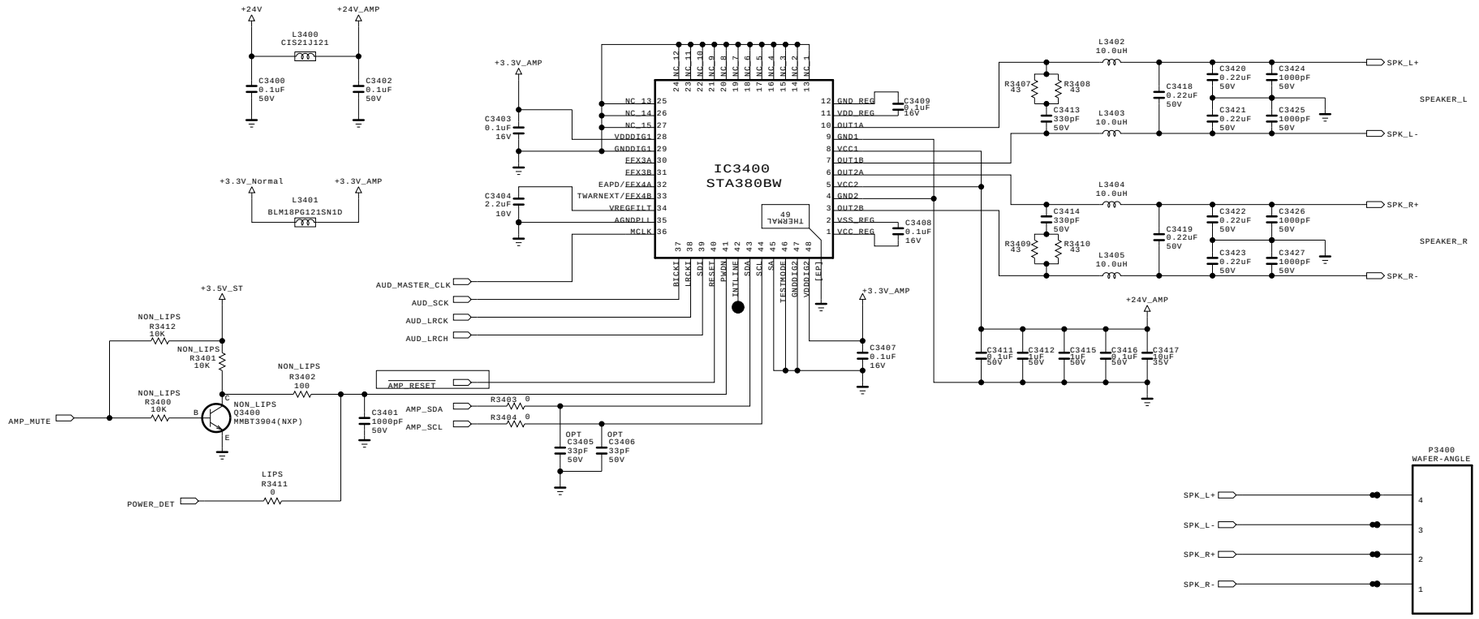
SECRET

LGElectronics

LG ELECTRONICS

MODEL	GP4L_S7LR2	DATE	2011/11/02
BLOCK	DVB_S	SHEET	27

AUDIO AMP(STA380BWE)



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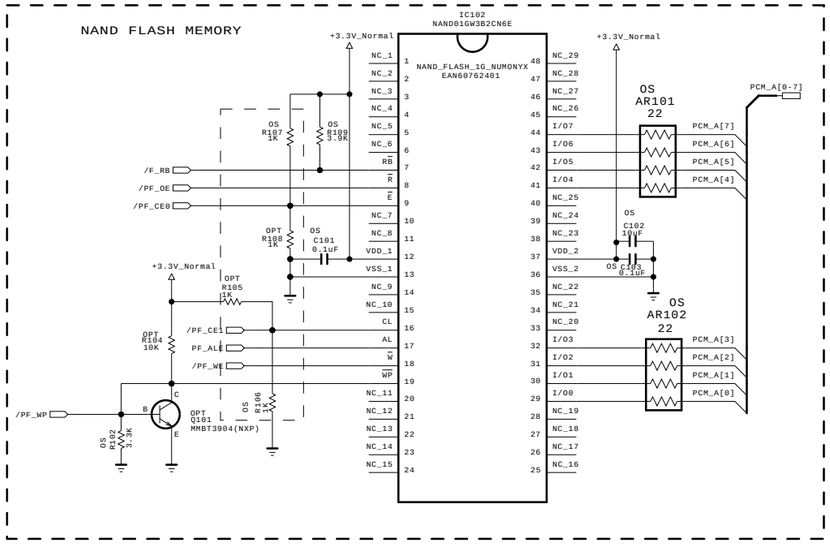
SECRET

LGElectronics

LG ELECTRONICS

MODEL	GP4L_S7LR2	DATE	2011/11/16
BLOCK	AMP_STA380BWE	SHEET	34

NAND FLASH MEMORY

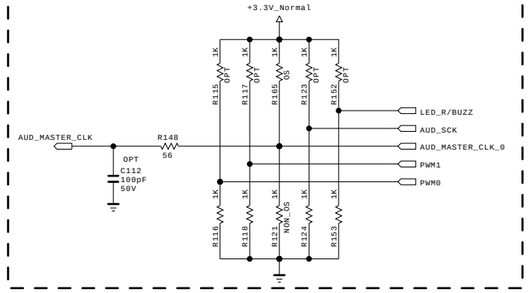


<CHIP Config(LED_R/BUZZ)>

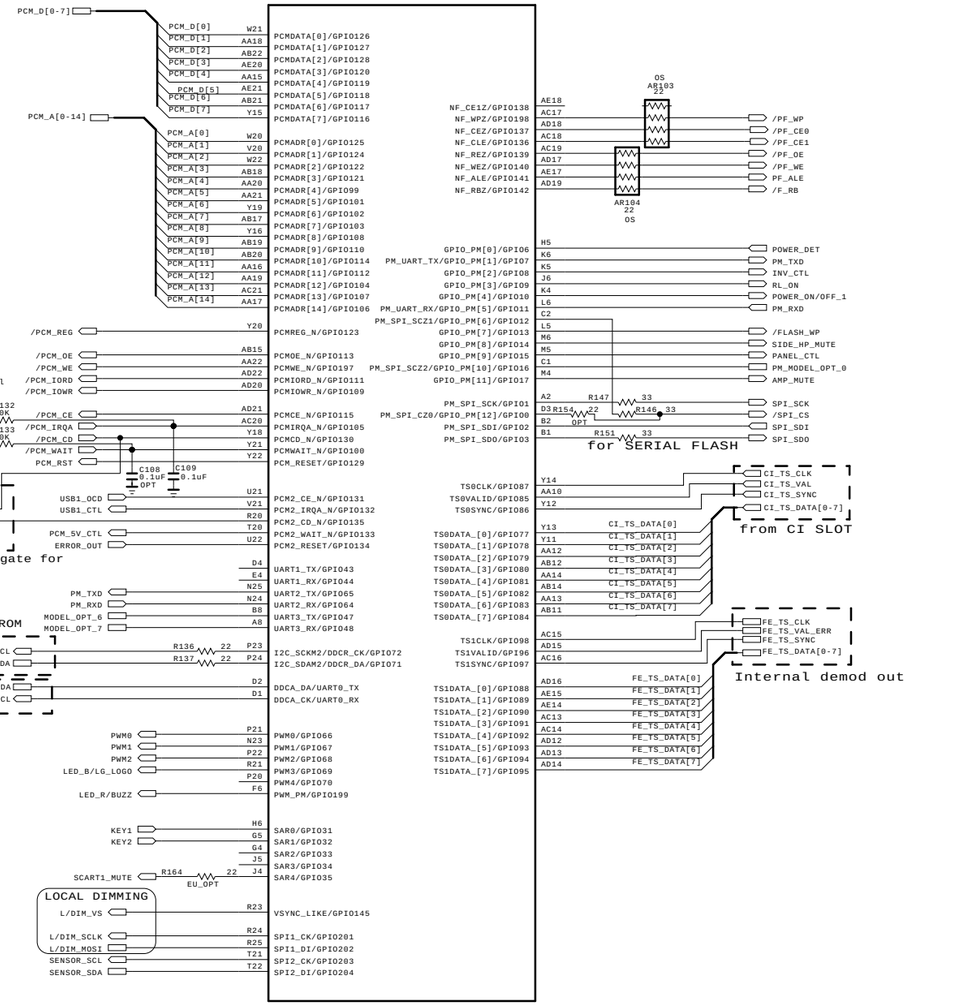
Boot from SPI CS1N(EXT_FLASH) 1'b0
Boot from SPI_CS0N(INT_FLASH) 1'b1

<CHIP Config>
(I2S_OUT_BCK,I2S_OUT_MCK,PAD_PWM1PAD_PWM0)

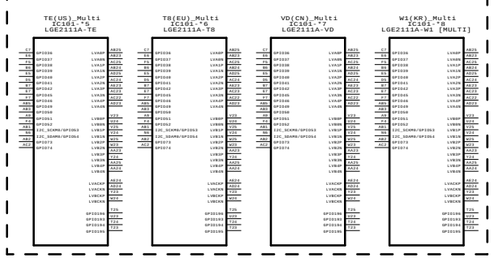
B51_no_EJ	: 4'b0000	Boot from 8051 with SPI flash
SB51_WOS	: 4'b0001	Secure B51 without scramble
SB51_WS	: 4'b0010	Secure B51 with scramble
MIPS_SPE_NO_EJ	: 4'b0100	Boot from MIPS with SPI flash
MIPS_SPI_EJ_1	: 4'b0101	Boot from MIPS with SPI flash
MIPS_SPI_EJ_2	: 4'b0110	Boot from MIPS with SPI flash
MIPS_WOS	: 4'b1001	Secure MIPS without scramble
MIPS_WS	: 4'b1010	Secure MIPS with SCRAMBLE

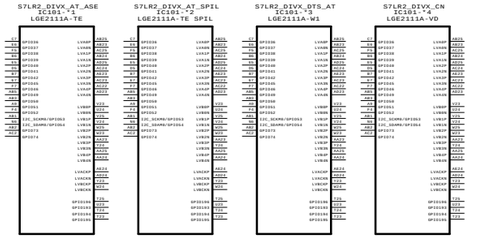


S7LR2_DIVX_MS10
IC101
LGE2111A-T8



MSTAR (IC101) Multi package (11.11.18~)





NAND_FLASH_1G_HYNIX

EAN35669102
IC102-*1
H27U1G8F2BTR-BC

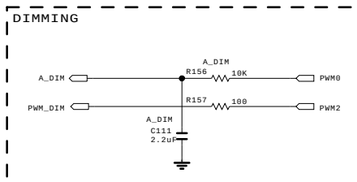
NAND_FLASH_1G_SS

EAN61857001
IC102-*2
K9F1G08U0D-SCB0

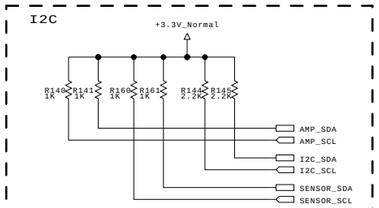
NAND_FLASH_1G_TOSHIBA

EAN61500801
IC102-*3
TC58NVG0S3ETA0BBBH

DIMMING

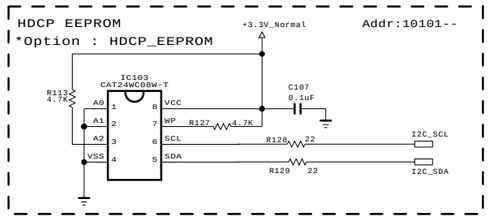


I2C

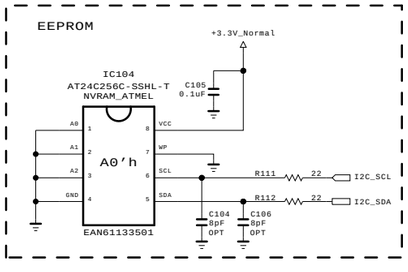


HDCP EEPROM

*Option : HDCP_EEPROM

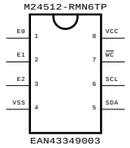


EEPROM



NON_OS_512k_ST

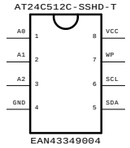
IC104-*3
M24512-RMN6TP



EAN43349003

NON_OS_512k_ATMEL

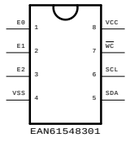
IC104-*4
AT24C512C-SSHD-T



EAN43349004

NVRAM_ST

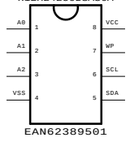
IC104-*1
M24256-BRMN6TP



EAN61548301

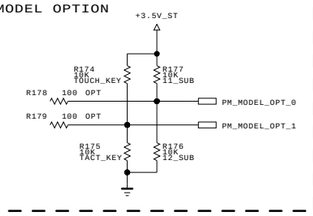
NVRAM_RENESAS

IC104-*2
R1EX24256BSAS0A

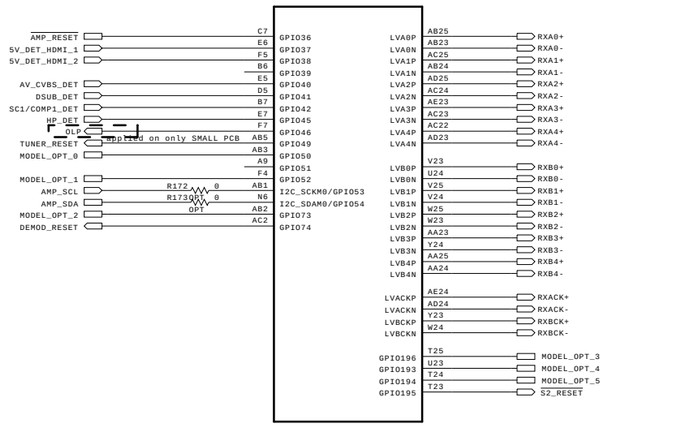


EAN62389501

PM MODEL OPTION



S7LR2_DIVX_MS10
IC101
LGE2111A-T8



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SECRET

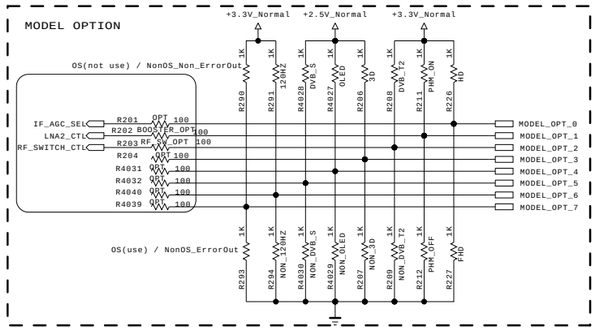
LGElectronics

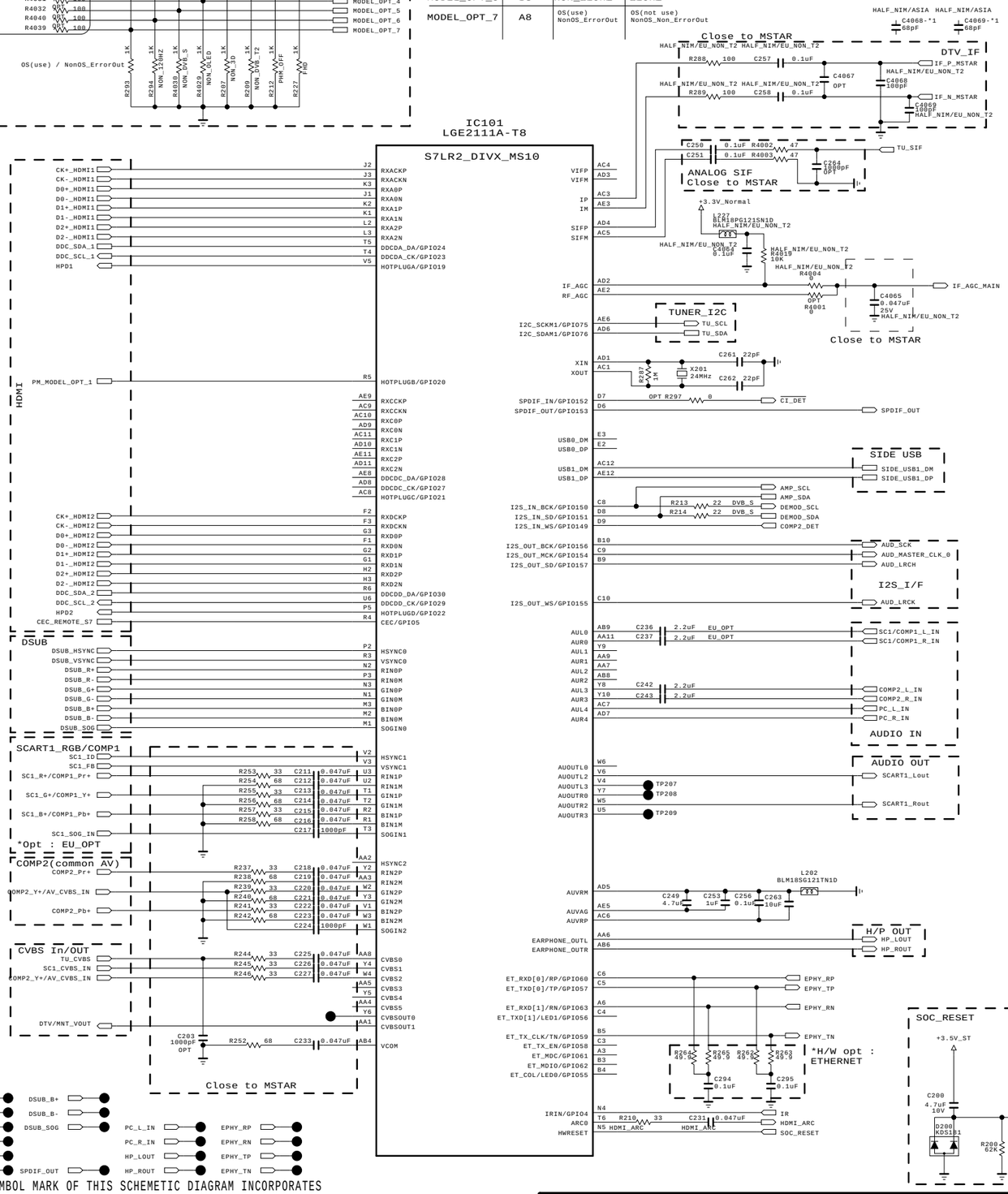
LG ELECTRONICS

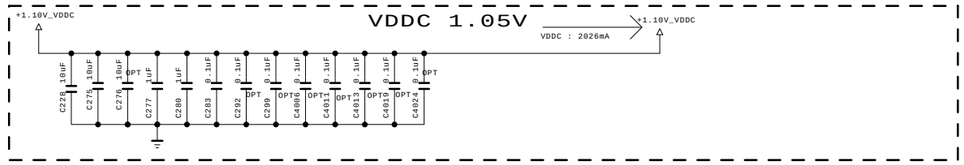
MODEL	GP4L_S7LR2	DATE	2011.11.02
BLOCK	FLASH/EEPROM/GPIO	SHEET	50

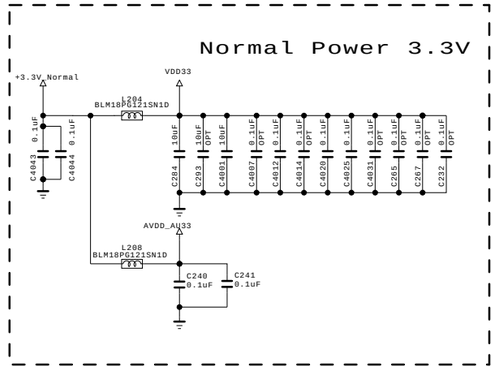
MODEL OPTION

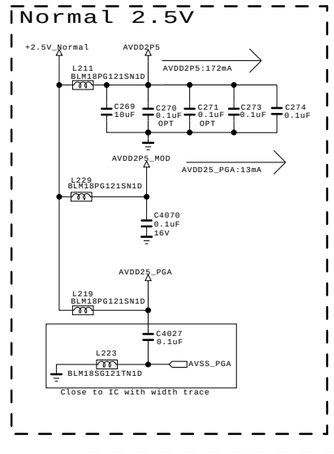
PIN NAME	PIN NO.	LOW	HIGH
MODEL_OPT_0	AB3	FHD	HD
MODEL_OPT_1	F4	PHM_OFF	PHM_ON
MODEL_OPT_2	AB2	NON_DVB_T2	DVB_T2
MODEL_OPT_3	T25	NON_3D	3D
MODEL_OPT_4	U23	NON_OLED	OLED
MODEL_OPT_5	T24	NON_DVB_S	DVB_S
MODEL_OPT_6	B8	NON_120HZ	120HZ
MODEL_OPT_7	A8	OS(use) NonOS_ErrorOut	OS(not use) NonOS_Non_ErrorOut

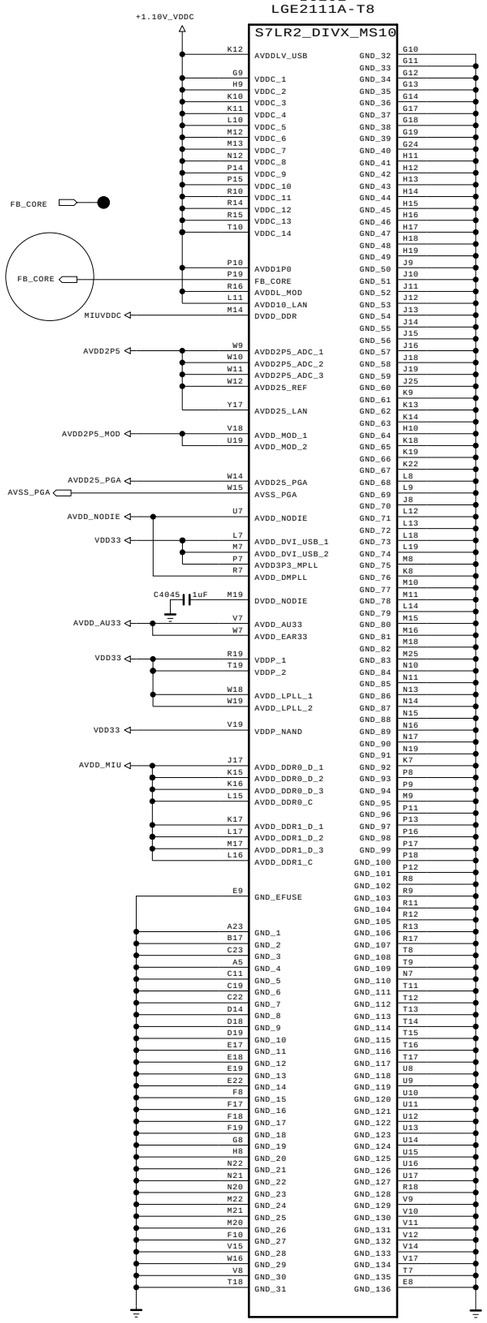


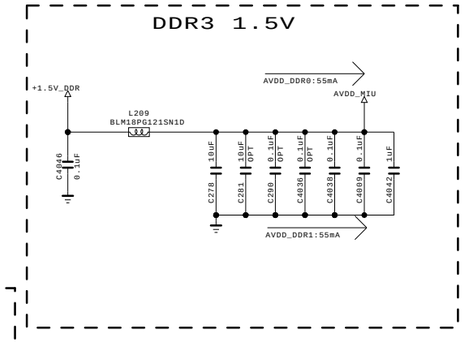


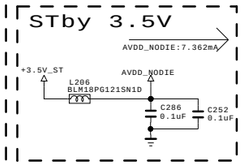


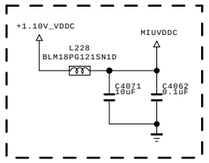


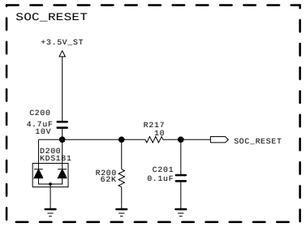












DSUB_HSYNC, DSUB_VSYNC, DSUB_R+, DSUB_R-, DSUB_G+, DSUB_G-, DSUB_B+, DSUB_B-, DSUB_SOG, SPDIF_OUT, PC_L_IN, PC_R_IN, HP_LOUT, HP_ROUT, EPHY_RP, EPHY_RN, EPHY_TP, EPHY_TN

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SECRET

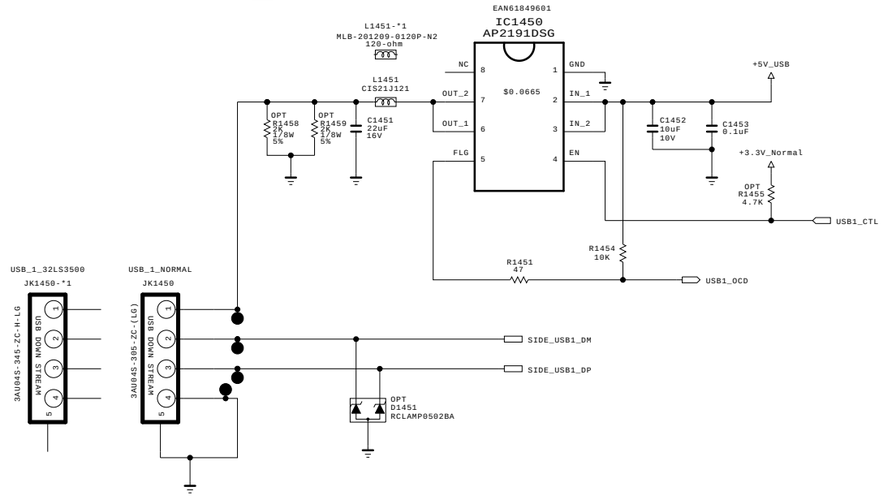
LGElectronics

LG ELECTRONICS

MODEL	GP4L_S7LR2	DATE	2011.08.24
BLOCK	POWER,IN/OUT,H/W OPT	SHEET	51

USB (SIDE)

USB1_DIODES



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SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION.
FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS
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THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

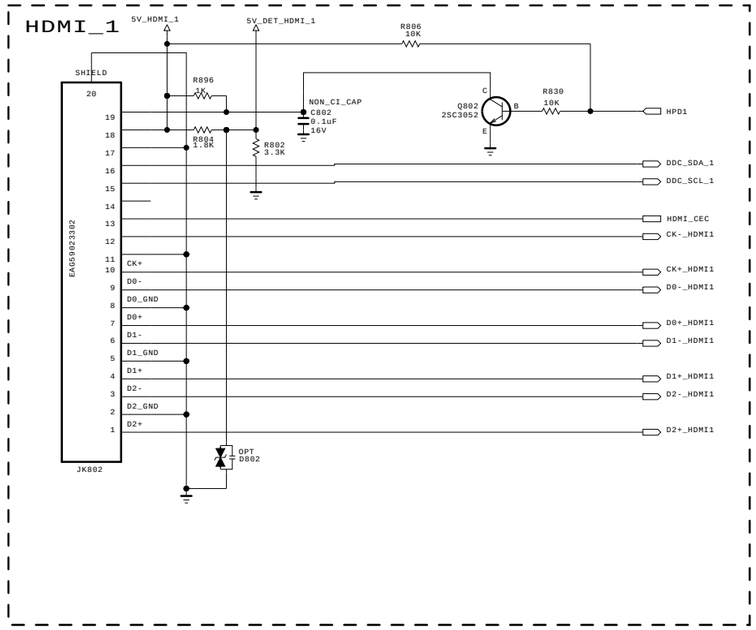
SECRET

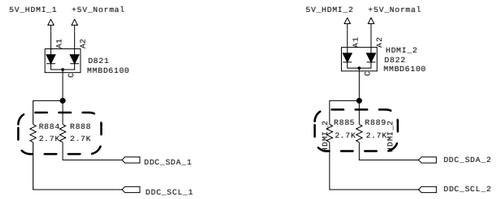
LGElectronics

LG ELECTRONICS

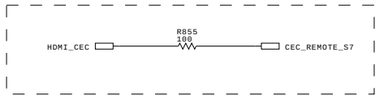
MODEL	GP4L_S7LR2	DATE	2011/11/18
BLOCK	USB_OCP_DIODE_1EA	SHEET	52

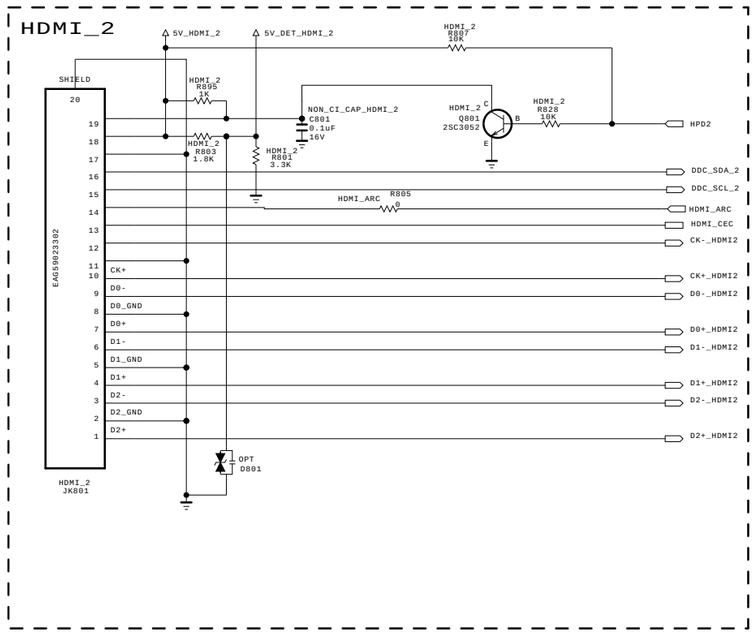
HDMI_2EA(NON SIDE HDMI)





For CEC





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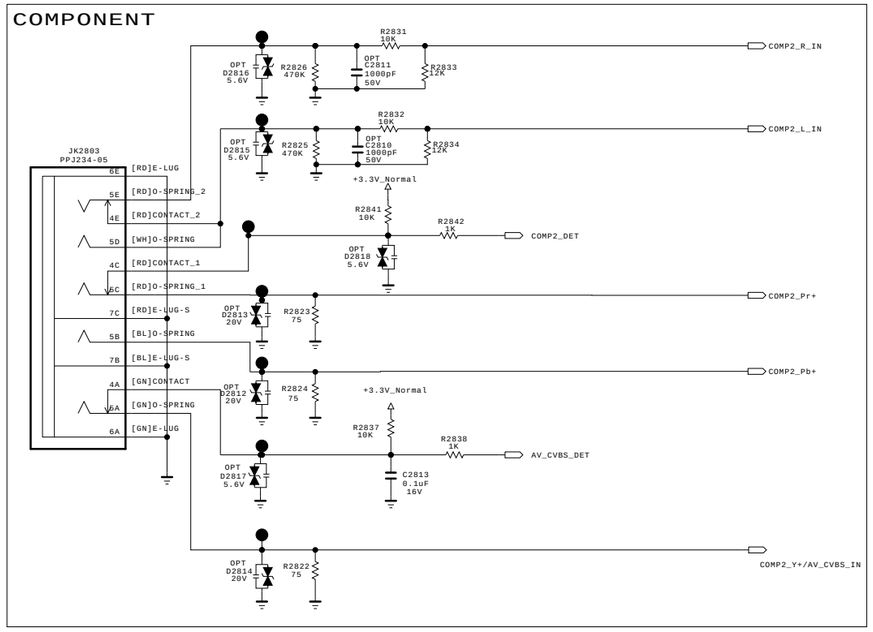
SECRET

LGElectronics

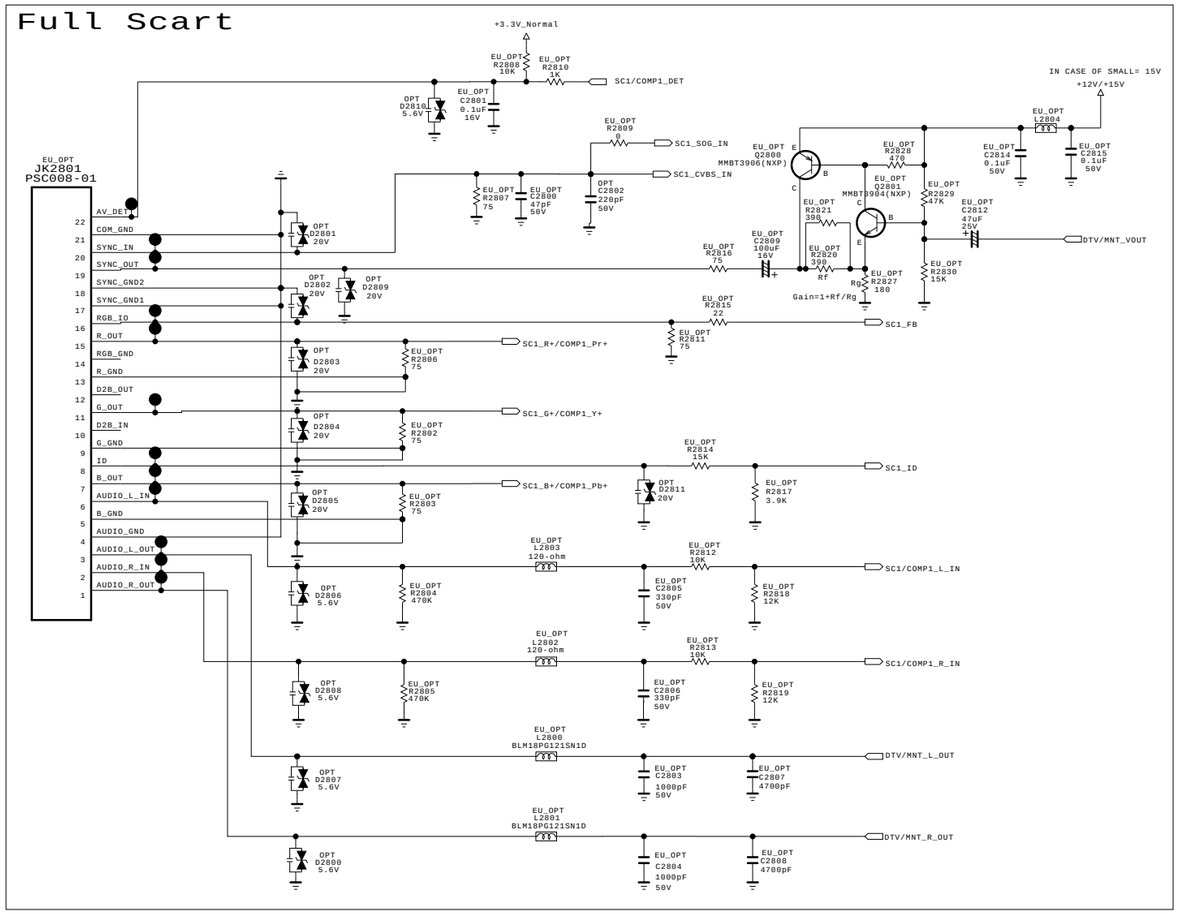
LG ELECTRONICS

MODEL	GP4L_S7LR2	DATE	2011/08/12
BLOCK	HDMI_2EA(NON SIDE HDMI)	SHEET	53

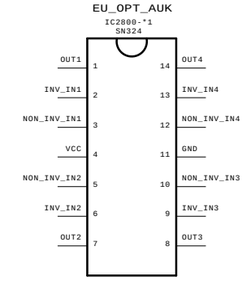
COMPONENT



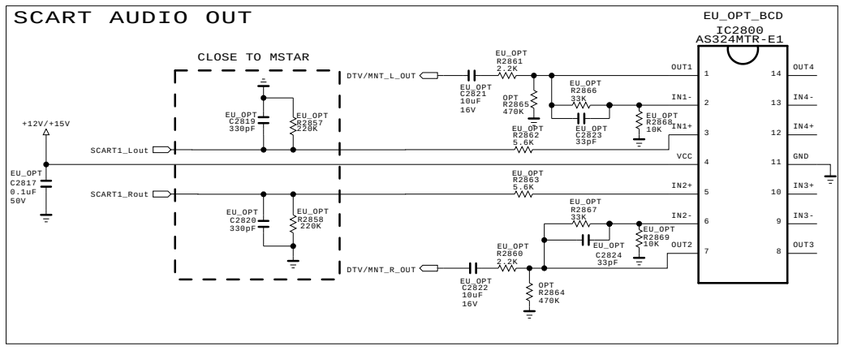
Full Scart



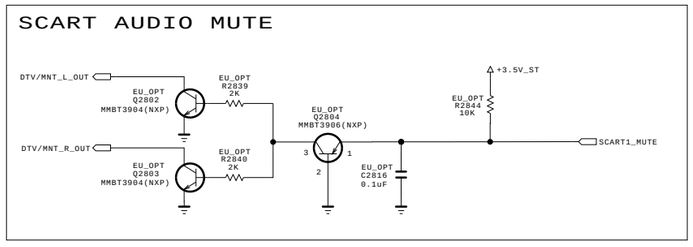
EU_OPT_AUK



SCART AUDIO OUT



SCART AUDIO MUTE



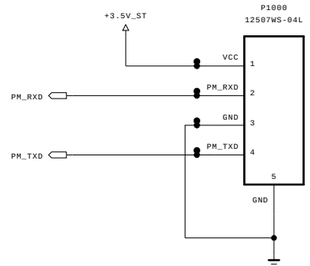
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP4L_S7LR2	DATE	2011/08/13
BLOCK	REAR_JACK_EU(ERRC)	SHEET	55

RS-232C 4PIN



THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

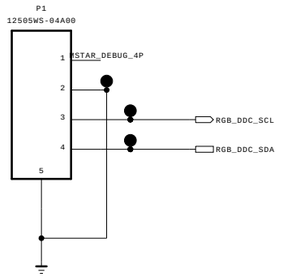
SECRET

LGElectronics

LG ELECTRONICS

MODEL	GP4L_S7LR2	DATE	2011/09/26
BLOCK	RS232C_4PIN	SHEET	57

MSTART DEBUG_4PIN



THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES
SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION.
FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS
ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR
THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP4L_S7LR2	DATE	2011/09/05
BLOCK	MSTAR DEBUG_4PIN	SHEET	58

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